

Ehrmann, Michael; Tzamourani, Panagiota

**Working Paper**

## Memories of high inflation

ECB Working Paper, No. 1095

**Provided in Cooperation with:**

European Central Bank (ECB)

*Suggested Citation:* Ehrmann, Michael; Tzamourani, Panagiota (2009) : Memories of high inflation, ECB Working Paper, No. 1095, European Central Bank (ECB), Frankfurt a. M.

This Version is available at:

<https://hdl.handle.net/10419/153529>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



EUROPEAN CENTRAL BANK

EUROSYSTEM

**WORKING PAPER SERIES**

**NO 1095 / SEPTEMBER 2009**

**MEMORIES OF HIGH  
INFLATION**

by Michael Ehrmann  
and Panagiota Tzamourani



EUROPEAN CENTRAL BANK

EUROSYSTEM



## WORKING PAPER SERIES

NO 1095 / SEPTEMBER 2009

### MEMORIES OF HIGH INFLATION<sup>1</sup>

by Michael Ehrmann<sup>2</sup>  
and Panagiota Tzamourani<sup>3</sup>



In 2009 all ECB publications feature a motif taken from the €200 banknote.

This paper can be downloaded without charge from <http://www.ecb.europa.eu> or from the Social Science Research Network electronic library at [http://ssrn.com/abstract\\_id=1476196](http://ssrn.com/abstract_id=1476196).



<sup>1</sup> We would like to thank an anonymous referee, Dimitris Georganakos, Bernd Hayo and seminar participants at the ECB for helpful comments and suggestions. This paper presents the authors' personal opinions and does not necessarily reflect the views of the European Central Bank, the Bank of Greece or the Eurosystem.

<sup>2</sup> European Central Bank, Kaiserstrasse 29, D-60311 Frankfurt am Main, Germany; e-mail: [michael.ehrmann@ecb.europa.eu](mailto:michael.ehrmann@ecb.europa.eu)

<sup>3</sup> Bank of Greece, 21, E. Venizelos Avenue, GR-10250 Athens, Greece; e-mail: [TTzamourani@bankofgreece.gr](mailto:TTzamourani@bankofgreece.gr)

© European Central Bank, 2009

**Address**

Kaiserstrasse 29  
60311 Frankfurt am Main, Germany

**Postal address**

Postfach 16 03 19  
60066 Frankfurt am Main, Germany

**Telephone**

+49 69 1344 0

**Website**

<http://www.ecb.europa.eu>

**Fax**

+49 69 1344 6000

*All rights reserved.*

*Any reproduction, publication and reprint in the form of a different publication, whether printed or produced electronically, in whole or in part, is permitted only with the explicit written authorisation of the ECB or the author(s).*

*The views expressed in this paper do not necessarily reflect those of the European Central Bank.*

*The statement of purpose for the ECB Working Paper Series is available from the ECB website, <http://www.ecb.europa.eu/pub/scientific/wps/date/html/index.en.html>*

ISSN 1725-2806 (online)

# CONTENTS

Abstract	4
Non-technical summary	5
1 Introduction	6
2 The data and the econometric model	7
3 Inflation experience and inflation concerns	15
3.1 Determinants of respondents' first priority	15
3.2 The relevant horizon for agents' memories	19
3.3 Determinants of respondents' second priority	19
4 Conclusions	20
References	22
Figures and tables	24
Appendix	35
European Central Bank Working Paper Series	39

## Abstract

Inflation has been well contained over the last decades in most industrialized countries. This implies, however, that memories of high inflation are likely to fade, because over time larger parts of the population have never experienced high inflation, whereas those who have might forget. This paper tests whether memories of high inflation affect agents' preferences about the importance attached to price stability, using a large database covering over 52,000 survey responses from 23 countries over the years 1981-2000. It finds that memories of hyperinflation are there to last, whereas those of less drastic inflation experiences tend to erode after around 10 to 15 years. The recent decline in the importance attached to price stability does therefore most likely reflect mitigated inflation concerns in an environment of low and stable inflation, but also the consequences of fading memories of high inflation. The longer central banks have successfully delivered price stability, the more important it is for them to engage in a proactive communication, especially with the younger generations, about the merits of low and stable inflation.

Keywords: inflation aversion, inflation memories, hyperinflation, World Values Survey, inflation targeting

JEL classification: D10, E31, E52



## Non-technical summary

Inflation outcomes are very likely to, at least partially, reflect the preferences of societies. Without public support, central banks will find it much more difficult to disinflate a high inflation economy, or to prevent inflation from rising in the first place. The different inflation experiences across countries in the 1980s, for instance, have often been explained by variations in the inflation aversion of the general public. In that debate, references have typically been made to the German case, where allegedly public support for the Bundesbank's anti-inflationary stance was high due to the German experience of hyperinflation in 1923.

This discussion suggests that memories of high inflation are a relevant factor in shaping a society's preferences. If this is the case, industrialized countries might be about to experience a reduced inflation aversion among their citizens, given the fact that inflation has been moderate over the recent past. Over time, fewer and fewer members of the societies of industrialized countries will have a vivid memory of the great inflation of the 1970s/1980s (and of course even more so of the hyperinflation episodes, which date back much longer) – either because they have not experienced it, or because they forget over time.

This paper tests for the role of inflation memories in shaping the preferences of economic agents. It uses data obtained from the World Values Survey, covering over 52,000 responses obtained in 4 waves of the survey, conducted over the years 1981-2000 in 23 industrialized countries, to illustrate that over the more recent period, the importance attached to fighting rising prices has generally and steadily declined. While this could simply reflect that agents pick other priorities in times when inflation is not seen to be a current problem, and as such might not be indicative of a declining inflation aversion among the general public, the paper goes further to show that the likelihood of being concerned about rising prices is closely related to the extent to which an individual has already experienced high inflation. In particular, having lived through hyperinflation during adult lifetime implies a substantially larger concern about inflation, which furthermore does not tend to erode. Less drastic experiences of high inflation, in contrast, are found to be in agents' minds for around 10 to 15 years, and subsequently fade.

These findings have important implications for central banks. They suggest that public support for their mandate could possibly erode over time, due to the central banks' own successes in taming inflation, thus lowering the sensitivity of the public towards rising prices. The longer central banks have successfully delivered price stability, the more important it is for them to engage in a pro-active communication, especially with the younger generations, about the merits of low and stable inflation. Fortunately, the findings in this paper suggest that central banks have tools at their disposal to shape public views about inflation, as the general public appears to be perceptive to central bank communication.

## 1. Introduction

In democracies, agents' preferences about policy priorities are an important input into the decision-making process of politicians. With regard to macroeconomic policies, a society's inflation aversion has often been seen as a major determinant of the design of the monetary institutions and of macroeconomic outcomes. For instance, the granting of independence to the Deutsche Bundesbank and the avoidance of the great inflation of the 1970s/1980s in Germany have often been ascribed to a high inflation aversion of the German society, which itself is usually assumed to have resulted from the fact that Germany had experienced hyperinflation in 1923 (Beyer et al. 2009, Issing 2005, Hayo 1998, Cukierman 1992).

Inflation aversion is most likely not constant over time. For central banks (including the Bundesbank), inflation aversion as revealed from their policy conduct has been found to vary (Kuzin 2006, Cecchetti and Ehrmann 2002); at the same time, the preferences of society are likely not time invariant either, due to i) time-varying preferences of individuals, or ii) a changing composition of the population. With inflation having been well contained in most industrialized economies over the last decades, it is important to understand whether this will affect inflation aversion of individuals, and thus the evolution of the aggregate views about how to conduct monetary policy. With memories of high inflation fading (because society is composed of more agents who have never experienced high inflation themselves, and because agents who have experienced high inflation might start forgetting), public support for the pursuit of price stability might also erode. To understand the possible evolution of societal preferences over time, and the possibilities for a decline in inflation aversion on the background of low and stable inflation in most industrialized economies over a prolonged period of time, it is crucial to study the relevant issues at the microeconomic level.

In this paper, we will use data obtained from the World Values Survey, covering over 52,000 responses obtained in 4 waves of the survey, conducted over the years 1981-2000 in 23 industrialized countries, to illustrate that over the more recent period, the importance attached to fighting rising prices has generally and steadily declined. While this could simply reflect that agents pick other priorities in times when inflation is not seen to be a current problem, and as such might not be indicative of a declining inflation aversion among the general public, the paper goes further to show that the likelihood of being concerned about rising prices is closely related to the extent to which an individual has already experienced high inflation. In particular, having lived through hyperinflation during adult lifetime implies a substantially larger concern about inflation, which furthermore does not tend to erode. Less drastic experiences of high inflation, in contrast, are found to be in agents' minds for around 10 to 15 years, and subsequently fade.

This implies that young agents in industrialized economies, by not having been exposed to spells of high inflation, are substantially less likely to consider the combat of inflation as a societal priority. These findings have important implications for central banks. They are suggestive that there is a possibility of an eroding support for their mandate over time, which is brought about by the central banks' own success in taming inflation, thus lowering the sensitivity of the public towards rising prices. The longer central banks have successfully delivered price stability, the more important it is for them to engage in a pro-active communication, especially with the younger generations.

The paper is related to various strands of the literature. In modern macroeconomic theory, the conduct of monetary policy is typically analyzed under the assumption that central banks set monetary policy in relation to a social loss function, with inflation aversion affecting the weight given to inflation stabilization (Woodford 2003). However, given that these models are typically based on the assumption of representative agents, heterogeneous preferences are not generally taken into account. Aggregation issues have received somewhat more attention in the definition of the appropriate inflation measure that a central bank should target. Mankiw and Reis (2003) model this problem, using representative consumers, yet heterogeneous sectors that can differ with regard to their size, cyclical sensitivity, price rigidities or magnitude of sectoral shocks. The assumption of a representative consumer is of course questionable, and becomes important in the discussion of plutocratic versus democratic price indices (Prais 1959). Both approaches compute the consumer price index as an aggregation of household price



indices, but they use different weights: in the former, the weight of each household is determined by its expenditure share, whereas for the latter each household receives the same weight.

Another strand of the literature studies the determinants of inflation aversion of economic agents. Shiller (1997) analyses the results of a survey about why people dislike inflation, and discovers differences in opinions across countries, as well as between generations. With regard to intergenerational differences, he finds (p. 59) that “in answering questions about what is really important and what our national leaders really ought to pay attention to”, people are influenced by their previous experiences of inflation and possible undesired effects of high inflation periods. In line with this, it has consistently been found that inflation affects self-reported well-being of economic agents (Alesina et al. 2004, Di Tella et al. 2003, Wolfers 2003). Also in that regard, earlier experience matters: Blanchflower (2007) shows that having experienced episodes of high inflation over their adult lifetime lowers the levels of happiness of economic agents, while Lombardelli and Saleheen (2003) as well as Malmendier and Nagel (2009) find that inflation expectations vary positively with inflation experience. Finally, Malmendier and Nagel (2007) show that having experienced high inflation leads households to invest less in bonds.

The notion that societal preferences have important repercussions on economic outcomes is also dealt with in the recent literature on culture in economics. Tabellini (2009), for instance, provides compelling evidence that there is a causal link between culture and economic development. Guiso et al. (2006) provide an overview of the relevant contributions to this literature, and remark that very little is known at the current stage about the factors that shape culture and make it persist. The concept of culture in this literature relates to values that are transmitted from generation to generation, and is therefore broader than the idea of inflation aversion in this paper (given that we do not analyze the intergenerational patterns); at the same time, an understanding of the determinants and the persistence of inflation aversion for a given individual is a first step in studying the determinants of cultural developments. A closely related paper to ours is Hayo (1998), who finds – using the same survey question as we do, yet based on the Eurobarometer survey – evidence for a “stability culture”, whereby survey respondents in low inflation countries tend to be more sensitive to increasing inflation rates than people in higher-inflation countries.

The present paper attempts to contribute to these lines of research. It describes the data and the methodology underlying our empirical analysis in Section 2. Section 3 provides the empirical results. Section 4 concludes.

## 2. The data and the econometric model

As mentioned above, we will test for the role of inflation experience in assessing the importance to fight rising prices using data from the World Values Survey (WVS). The WVS consists of representative national surveys of the basic values and beliefs of the general public in a large number of countries. It is conducted by a network of social scientists at leading universities all around world, coordinated by a central body, the World Values Survey Association<sup>1</sup>. The WVS builds on the European Values Surveys, first carried out in 1981. The subsequent waves, 1989-1993, 1994-1998 and 1999-2000 covered overall some 80 countries. For each country there are interviews with a representative national sample<sup>2</sup> of about 1000 people. The data are weighted so as to adjust for the survey design within the country and also weighted when pooled together so as to equalize the contribution of each country/wave in the sample.

---

<sup>1</sup> See <http://www.worldvaluessurvey.org/>. Data for the 2005 wave has just recently been made available publicly for a subset of the countries analyzed in this paper. We have not updated the dataset, first due to the partial coverage (currently, only data for 13 out of our 23 countries are available), and second because the inclusion of data after the euro cash changeover might complicate the analysis due to possible gaps between actual and perceived inflation (see, e.g., European Central Bank 2005).

<sup>2</sup> Some cases where the samples are non-representative are described in Stevenson and Wolfers (2008). Our data do not include any non-representative samples.

The data, apart from the questions on various values and beliefs, contain information on sociodemographic characteristics of the individuals, such as age, gender, marital status, educational level, employment status, income. Numerous studies have been based on the World Values Survey, exploring a wealth of topics, covering for instance the change of cultural values of societies in the globe, as for example, Inglehart (1997), or the relationship of income and health, as in Jen et al (2009). While the survey is mainly of a sociological and political nature, it has recently been increasingly studied also by the economics profession. For instance, Stevenson and Wolfers (2008) and Layard (2008) have analyzed the relationship of happiness and economic growth; Guiso et al. (2003) use it to investigate the effect of religion on economic attitudes, and Georgarakos and Pasini (2009) employ the data on trust contained in the WVS to understand determinants of stock market participation.

Among the various belief questions, the survey contains a block of questions regarding respondents' views about what should be the most important policy priorities in the country of residence for the next 10 years. In that context, respondents are asked to indicate which of the following goals is considered to be the most important:

- Maintaining order in the nation
- Giving people more say in important government decisions
- Fighting rising prices
- Protecting freedom of speech

In a subsequent question, the respondent has the possibility to nominate a second priority from the same choice set. We will base our empirical analysis on these questions. Their exact wording entails a number of advantages and disadvantages for our study, several of which have already been highlighted by Hayo (1998). A first issue relates to the fact that respondents need to pick from a set of choices, rather than indicating the importance they attach to price stability as such. A disadvantage in that regard is that we do not observe respondents' priority sets fully – whether the fight against inflation takes the third or fourth rank is not observed. Furthermore, the alternatives that are on offer might not imply serious trade-offs (as would be the case if respondents needed to give priority to fighting inflation over reducing unemployment, for instance). At the same time, the advantage of the phrasing of this question is that it does force a choice. If respondents were asked to assign importance to various alternative goals independently, they might as well give all of them a priority status, a possibility that is excluded here.<sup>3</sup>

A second issue to note is that current events or developments can “crowd out” the other priorities. A drop in the share of respondents who pick the fight against inflation as priority could therefore arise either because they see inflation as less of a problem, or alternatively because another option of the list has gained in importance. What is important for our empirical analysis is therefore to properly control for current developments (both in inflation as well as in factors that might affect the likelihood to opt for another goal). Only controlling for such effects will allow us to treat the answers to this question as a proxy for the inflation aversion of individuals.

The dataset we use covers over 52,000 answers to these questions, in 4 waves of the survey conducted over the years 1981-2000 in 23 industrialized countries. Table 1 provides an overview of the coverage. We restricted the sample to industrialized countries, as a pooling of their data is only admissible if it is plausible to assume that the coefficients to be estimated are not too different between countries. For a relatively homogeneous group, this assumption seems more plausible. In any case, we will test for the homogeneity assumption by further splitting the sample of countries to those belonging to the European Union and all others. Another advantage of restricting the sample to industrialized countries is that all of these are long-established democracies, such that we would expect the political situation in each country to remain broadly stable over time compared to developing or emerging economies. While this cannot resolve the problem that concurrent political events could lead to shifts of respondents' priorities over time, it should at least make substantial shifts less likely.

---

<sup>3</sup> Please note that non-response for this question is very limited. Only 0.25% (2%) of respondents do not provide a first (second) priority.

In most countries, we have data for 2 or 3 of the survey waves. In Greece, Luxembourg, Portugal, Australia, Canada and New Zealand only one wave is available, whereas all four waves are contained for Germany, Spain and Japan. Some country waves are not included in our sample, namely if our dependent or explanatory variables have not been asked in that particular wave. This is, for instance, the case for the wave conducted in 1982 in the United States, such that our dataset comprises only three US waves, starting in 1990.

#### TABLE 1 HERE

A first look at the importance attached to price stability is provided in Table 2. A first thing to note is that fighting rising prices is on average not the most important concern of respondents. A random allocation would lead to a 25% share of respondents picking each choice. Instead, this number stands at only 15% for inflation as the first priority. Furthermore, inflation concerns have clearly abated when compared to the 1980s – inflation was chosen as first or second choice by 50% of respondents in the first wave, but only by 30% and 35% in the third and fourth waves, respectively. This implies a slight pickup in the most recent wave, albeit to levels substantially lower than those observed in the first wave. Furthermore, such a reconsideration of inflation concerns has not occurred in all countries alike. In the United States, for instance, numbers have steadily declined, from 43% of respondents giving inflation either first or second priority status in 1990, to a very low – also by international comparison – 27% in 1999.

#### TABLE 2 HERE

Another interesting feature is the breakdown by cohorts according to the year of birth. The more recently born cohorts show a much reduced inclination to put the fight against inflation on top of their list, especially when compared to the cohort born in 1925 or before.<sup>4</sup> Importantly, splits by age rather than by year of birth show much less of a declining pattern. The difference in results arises because the survey waves spread over 20 years, from 1981 to 2000, such that over time, individuals get assigned to different age groups. This suggests that (beyond a possible age factor), lifetime experience of an individual can possibly be important in the way this question gets answered.

Responses are clearly linked to the level of inflation prevailing at the time of the survey. Figure 1 plots the share of respondents mentioning fighting rising prices as first or second priority in each country and wave against contemporaneous inflation. A positive relationship is clearly discernible, although with a substantial variation, suggesting that other factors are also important in shaping these responses.

#### FIGURE 1 HERE

In order to model how the importance to price stability relates to current inflation and an individual's inflation experience, it is crucial to properly control for other possible determinants. In particular, given that the respondents are not asked to rank the importance of fighting rising prices on a given scale, but rather need to decide whether or not to prioritize inflation in a list of alternative choices, it is important to simultaneously control for possible determinants of the alternative choices. We do so in the following way:

The survey contains a large number of other questions, some of which could potentially be interesting for our purposes. In particular, we will employ the data on gender, on education, on income and on the age of the respondent to cover the most important demographic characteristics. In addition, we know from the survey whether the respondent is the “chief wage earner in the house”, how often she discusses

---

<sup>4</sup> E.g., the share of respondents giving priority to fighting rising prices is statistically significantly larger for the cohort born prior to 1926 than for the cohort born after 1970 at the 1% level, for all waves jointly as well as for every wave individually, for first or second priority (with only one exception, namely fighting rising prices as second priority in the 1994-1999 wave, where the difference is statistically significant at the 5% level).

political matters with friends, and finally the respondents' self-positioning on the political scale from right to left.

The demographic controls are important, given earlier evidence that females tend to have higher inflation perceptions and inflation expectations than men, and that age, income as well as education are important in that regard (Bryan and Venkatu 2001, Lombardelli and Saleheen 2003, Christensen et al. 2006). Income is also known to affect the importance attached to combating inflation: Easterly and Fischer (2001) have shown that the poor are more likely to mention inflation as a national concern in a similar survey covering 38 countries. Furthermore, each of the demographic factors might also affect the importance attached to any of the other choices in the survey.

Table 3 provides summary statistics for each of our explanatory variables. Our control for gender is a dummy variable that is equal to one for females. As Table 3 shows, 49% of all respondents are female. We measure age at the time of the survey, aggregated in age groups (18-24, 25-34, 35-44, 45-54, 55-64, 65+), and differentiate three levels of education, low (elementary school or below), middle (completed secondary school), upper (with some university education, with or without degree)<sup>5</sup>. With regard to income, our variable considers 9 relative income levels. Respondents were asked to assess their income on a ten band scale of income relative to the respondent's national norm. We further collapsed the two upper deciles as for some countries and waves they contained very few responses. To account for the fact that income is measured in relative terms to the current national income distribution, we allow for country-specific slope coefficients in our regression models.

#### TABLE 3 HERE

The other three variables obtained from the WVS are less standard, and were chosen in the light of the alternative choices available to respondents. All other answer categories relate to political concepts, such that it is important to control for the importance that the individual attaches to political questions (proxied by the frequency of political discussions), where we would expect a more politically active person to be less likely to pick inflation as a priority. An individual's political views might be important for which of the three political priorities a respondent chooses. Accordingly, we enter the self-positioning of the individual on the political spectrum as a possible control variable (see also van Lelyveld 1999). Last, we also control for whether or not a respondent is the main wage earner in the household, as this might affect the importance attached to price stability.

These variables are measured as follows. The importance of political discussions is defined on a range from 1 (frequent discussions) to 3 (the respondent never discusses political matters with friends), such that a higher value for this variable denotes *less* political interest. The self-positioning of respondents in the political spectrum is performed on a scale from 1 to 10, where 1 indicates the left, and 10 the right end of the spectrum.

An important variable for our hypotheses relates to the inflation experience that respondents have gained prior to the survey. We confine the analysis to inflation experience during an individual's adult lifetime (i.e., as of the age of 18), but results are robust to further expanding this horizon, e.g. to the experience as of the age of 12. In particular, we are interested in the maximum annual inflation rate that the respondent has experienced up until the survey. This variable is therefore specific to all individuals of a given year of birth in a given country, for a given survey wave. To construct such a variable, long historical data series of inflation are required. We have availed ourselves of Global Financial Data<sup>6</sup>, a

---

<sup>5</sup> For some countries and waves only 'age when completed education' was recorded instead of 'educational level'. Since the relationship between the two was not entirely clear-cut (for example, there were many cases with recorded 'age when completed education' above 14 or even 18 and yet 'lower' educational level'), we imputed educational level based on 'age completed education' and employment status. The imputation models were estimated from the country waves where both education variables were observed. Our final results are stable whether we use the imputed educational level or the 'age when completed education'.

<sup>6</sup> <https://www.globalfinancialdata.com/>

database which contains historical and financial data for about 200 countries (some going back to the thirteenth century). A caveat is in order here. We base respondents' inflation experience on the national historical data of the country where the interview took place. In case of immigrants, this might, however, not reflect the actual inflation experience. For that reason, we have eliminated all cases where the respondent has indicated that the country of birth is not the one of the interview. This can only mitigate the issue, though, for a number of reasons. First, the relevant question on the country of birth is not available for all respondents. Second, respondents might have spent parts of their life abroad, even if they were born in the country of the interview.

Table 3 shows the enormous heterogeneity across individuals: very few of them have experienced *negative* inflation as their maximum (namely 16 respondents who were aged either 18 or 19 at the time of the survey), whereas at the other extreme, some have experienced hyperinflation, up to astronomical rates of 302,000,000% p.a., as measured in Greece in 1944. 5% of the respondents have lived through inflation rates above 80%. The enormous rates at the very tail of the distribution raise the mean inflation experience to a level of 18,475,070%, whereas the median is a much more modest 15.2%. Of course, this variable differs strongly across the various cohorts. Figure 2 plots histograms by year of birth. In order to visualize the distribution, the chart does not display any rate above the 95<sup>th</sup> percentile, i.e. above 80%, a treatment that affects the two oldest cohorts only, i.e. those born prior to 1926, or in between 1926 and 1940. Despite the deletion of these outliers, the figure demonstrates that the more recently born cohorts clearly have had more uniform experiences, with a much reduced dispersion, and furthermore a substantially lower mean.

#### FIGURE 2 HERE

In our benchmark specifications, we will consider the maximum annual inflation rate that the respondent has experienced over the last 15 years (rather than over the entire adult lifetime, as underlying Figure 2 and Table 3), but we will vary this time span in a robustness test from 5 years to the entire adult life. For the benchmark specification, this amounts to first choosing the beginning of the relevant time span, which is given either by the year the respondent was turning 18, or by the year of the survey minus 15. The maximum inflation over the time window from this determined starting point until the survey year is then calculated, and assigned to the individual for that particular survey. Given the enormous heterogeneity in this variable, we transform it for our econometric analyses into a more tractable format, by calculating the deciles of the distribution over the entire sample, and by assigning each individual a value of 1 to 10, depending on her position in the distribution (e.g., a value of 1 is assigned for individuals whose inflation experience is below the first decile).

In addition, we are interested in the hypothesis whether having lived through hyperinflation has a lasting effect on people's attitudes. As there is no commonly agreed definition of hyperinflation, we have arbitrarily decided on a threshold of 200% annual inflation (but will discuss how changing this threshold affects our results). There are 770 individuals in the sample with such an experience, i.e. 1.5% of our sample, in Austria and Germany (around 1922-1923) and in Greece, Italy and Japan (around 1944-1946).<sup>7</sup> For these individuals, our dummy variable "hyperinflation" takes the value of 1, for all others it is equal to zero.

In analogy to our hypothesis that past experience matters for the choice of inflation in the survey, other experiences might also be important when it comes to choosing the political alternatives maintaining order in the nation, giving people more say in important government decisions, or protecting freedom of speech. By definition, however, the relevant factors that might explain the choice of these priorities are much more difficult to control for, and much harder to quantify. Furthermore, as for inflation, long historical time series are called for. One possibility is the data contained in the Cross-National Time Series Data Archive<sup>8</sup>, an archive which contains data for over 200 countries, some going back to the

<sup>7</sup> We have verified the occurrence of hyperinflation in these countries using other publicly available information, such as Wikipedia, or the websites and publications of the respective central banks.

<sup>8</sup> <http://www.databanksinternational.com/>



nineteenth century, covering, among other, historical national data on the number of assassinations, general strikes, guerrilla warfare, government crises, purges, riots and revolutions as well as anti-government demonstrations p.a.. Of these, only the latter turned out to be relevant for our analysis. Just as in the case of inflation experience, we have constructed a variable that contains the maximum number of anti-government demonstrations in a year that an individual has experienced over his lifetime or various different horizons, always only taking into account the experience as of the age of 18. Figure 3 shows the distribution of respondents' lifetime experience, suggesting that there is less heterogeneity than for inflation, but a similar variation across cohorts: more recently born cohorts have less dispersed experiences, and the distribution tends to have a lower mean.

The life time experience for this variable is reasonably well behaved, such that we do not rearrange individuals according to their position on the distribution, but rather use the underlying variable itself in the regression. As with inflation, we will use the experience over 15 years in our benchmark regressions, but provide an assessment of the robustness to this assumption.

FIGURE 3 HERE

To analyze the responses to the question of interest described above (say, 'priority 1'), which encompasses four alternatives, we use a multinomial logit approach. The model is formulated in terms of the log of the odds  $\Omega$  of an outcome relative to a base category/outcome. For a dependent variable  $y$  with  $J$  alternatives, and explanatory variables  $x_k$ , summarized in the vector  $\mathbf{x}$ , the model can be written as

$$(1) \quad \ln \Omega_{m|b}(\mathbf{x}) = \ln \frac{\Pr(y = m | \mathbf{x})}{\Pr(y = b | \mathbf{x})} = \mathbf{x} \boldsymbol{\beta}_{m|b} \quad \text{for } m = 1 \text{ to } J-1, \text{ and } m \neq b,$$

where  $b$  is the base category. For convenience we chose the base category to be 'fighting rising prices' (in short 'inflation'), thus we examine the odds of the three other alternatives relative to this one.

The model can be interpreted in terms of factor (multiplicative) changes in the odds. Exponentiating the two sides of the model above, we have a multiplicative model in terms of the odds of outcome  $m$  relative to the base category  $b$ ,

$$(2) \quad \Omega_{m|b}(\mathbf{x}) = \frac{\Pr(y = m | \mathbf{x})}{\Pr(y = b | \mathbf{x})} = \exp(\mathbf{x} \boldsymbol{\beta}_{m|b})$$

Holding other variables constant, a unit increase in the value of, say,  $x_k$  will lead to a factor change in the odds of  $m$  relative to  $b$  by  $\exp(\beta_{k, m|b})$ , or, an increase in the value of  $x_k$  to  $x_k + \delta$ , will lead to a factor change to these odds by  $\exp(\beta_{k, m|b} \times \delta)$ . The  $\exp(\beta_{k, m|b})$  - which we will report in our tables containing the econometric results - can also be interpreted as odds ratios:

$$(3) \quad \frac{\Omega_{m|b}(\mathbf{x}, x_k + \delta)}{\Omega_{m|b}(\mathbf{x})} = \exp(\beta_{k, m|b} \delta)$$

A value greater than one indicates that the odds of  $m$  vs.  $b$  increase as the explanatory variable increases, whereas a value below one implies that the odds decrease. Choosing 'inflation' as the benchmark category, we would therefore expect that a relatively high inflation experience (which should increase the importance placed on fighting inflation) leads to coefficients that are smaller than one. In the case of categorical variables, the coefficient for category  $n$  (say females) is the ratio of the odds of  $m$  vs.  $b$  for that category (females) relative to the same odds for the base category (males).

As discussed above, our primary interest is the effect of the inflation experience of an individual on her propensity to choose 'inflation', but it is important to control for the effects of other possible



determinants. We will therefore explore alternative combinations of explanatory variables, starting from a simplest model (Model 1) containing only the inflation experience as well as country fixed effects, wave fixed effects, and country-wave fixed effects. The subsequent models control for the sociodemographic characteristics of the individuals (gender, age, education, income), and the other personal characteristics discussed above, namely political position, participation in political discussions, whether they are the chief wage earner or not and their exposure to antigovernment demonstrations (Model 2). In a further extension, we also include whether or not an individual has experienced hyperinflation (Model 3).

Subsequently, we will drop the country-wave fixed effects (leaving country fixed effects and wave fixed effects) and try to explain the variation across countries and waves by the macroeconomic environment and the recent political unrest (as expressed with the index of antigovernment demonstrations; Model 4). As a final possible explanatory variable, we add the control for whether the country employs an inflation targeting strategy (Model 5). Finally, since the country-specific variables are also time specific and thus explain some of the time variation, we also drop the wave fixed effects (Models 6 and 7).<sup>9</sup>

The multinomial logit model rests on the assumption known as the independence of irrelevant alternatives (IIA), which prescribes that the odds of two alternatives should not depend on other alternatives available, and in that sense they are ‘irrelevant’. The two most well known formal tests for this assumption are the Hausman-McFadden (1984) test and the Small-Hsiao test (1985). The tests on our data show more often than not, applied on the various models that we have used, that the IIA assumption holds, the Small-Hsiao test always being favorable. However, since the usefulness of these tests in assessing violations of the IIA assumption has been doubted (Cheng and Long 2005) we also tested the robustness of our results by applying the multinomial probit model and results are indeed very similar. Moreover, since the question we analyze has been included continuously in the WVS and has thus been tested for over twenty years and analyzed extensively in the context of cultural values literature (for example, Inglehart 1997), we are confident that the alternatives seem sufficiently distinct to the respondents.

To test the robustness of the effects of our explanatory variables with regard to the importance attributed to fighting inflation, we also model separately the responses to the same question when asked as a second priority, ‘priority 2’, and also the probability of choosing ‘inflation’ as first or second priority, irrespective of the other alternatives that get chosen by the individual.

To model ‘priority 2’ we use again a multinomial logit model. Now, conditioning on each chosen alternative of ‘priority 1’, there are three remaining alternatives. Taking again ‘inflation’ as our base category, we model for each chosen alternative of ‘priority 1’ the two odds vs. ‘inflation’. The set of explanatory variables is that of Model 7. We only omit the hyperinflation variable because once the responses are conditioned on the response to ‘priority 1’, there are too few respondents having experienced hyperinflation in each subsample.

The probability of choosing ‘inflation’, irrespective of the other alternatives, is modeled in two settings: We first model choosing ‘inflation’ either as first or second priority; secondly, we take the order of this choice into account. For the first setting, we use a logit model, where the dependent variable is 1 if ‘inflation’ was chosen either as a first or second choice and 0 if it was not chosen at all. The logit model is derived in terms of an underlying variable where the probability of a positive response is observed when the underlying variable exceeds some threshold.

Assuming an underlying ‘importance attributed to inflation’

$$(4) \quad y_i^* = \beta'x_i + \varepsilon,$$

---

<sup>9</sup> We maintain the country fixed effects, as these are required to differentiate the slope of the income variable across countries.

whether an individual chooses ‘inflation’ as a priority in the survey or not, is indicated by the observable variable  $y$ , where

$$(5) \quad y_i = 0 \text{ if } y_i^* \leq 0 \text{ and } y_i = 1 \text{ if } y_i^* > 0$$

The probability of a positive response conditional on the vector of explanatory variables  $\mathbf{x}$ , is given by

$$(6) \quad \Pr(y = 1 | \mathbf{x}) = \Pr(y^* > 0 | \mathbf{x}) = \Pr(\mathbf{x}\boldsymbol{\beta} + \varepsilon > 0 | \mathbf{x}) = 1 - F(-\mathbf{x}\boldsymbol{\beta})$$

Assuming that the  $\varepsilon$  is distributed logistically with  $\text{Var}(\varepsilon) = \pi^2/3$  leads to the binary logit model

$$\Pr(y = 1 | \mathbf{x}) = \frac{\exp(\mathbf{x}\boldsymbol{\beta})}{1 + \exp(\mathbf{x}\boldsymbol{\beta})}, \text{ or, in terms of the odds of response 1 relative to response 0,}$$

$$(7) \quad \Omega(\mathbf{x}) = \frac{\Pr(y = 1 | \mathbf{x})}{\Pr(y = 0 | \mathbf{x})} = \exp(\mathbf{x}\boldsymbol{\beta})$$

Thus, for a unit change in  $x_k$ , the odds are expected to change by a factor of  $\exp(\beta_k)$ , holding all other variables constant. Like for the multinomial logit models, we will report the exponentiated coefficients  $\exp(\beta_k)$ . A value greater than 1 indicates that an increase in the explanatory variable, for instance in inflation experience, will increase the odds of choosing ‘inflation’.

In the second setting, making now use of the order of choice, we fit an ordered logit model, where the dependent variable is 2 if ‘inflation’ was chosen as a first priority, 1 if ‘inflation’ was indicated as a second choice and 0 if it was not chosen at all. Assuming again an underlying variable determining the observed response - an underlying ‘importance attributed to inflation’ by an individual, the measurement model for binary outcomes is expanded to divide  $y^*$  into  $K$  (3 in our case) ordinal categories,

$$(8) \quad y_i = m \text{ if } \tau_{m-1} \leq y_i^* \leq \tau_m \text{ for } m = 1 \text{ to } K$$

where the thresholds  $\tau_1$  through  $\tau_{K-1}$  are estimated. As usual, we assume  $\tau_0 = -\infty$  and  $\tau_K = \infty$ . The probability of observing  $y = m$  for given values of the  $x$ ’s corresponds to the region of the distribution where  $y^*$  falls between  $\tau_{m-1}$  and  $\tau_m$ :

$$(9) \quad \Pr(y = m | \mathbf{x}) = \Pr(\tau_{m-1} \leq y^* \leq \tau_m | \mathbf{x}).$$

Substituting  $\mathbf{x}\boldsymbol{\beta} + \varepsilon$  for  $y^*$ , we have

$$(10) \quad \Pr(y = m | \mathbf{x}) = F(\tau_m - \mathbf{x}\boldsymbol{\beta}) - F(\tau_{m-1} - \mathbf{x}\boldsymbol{\beta}),$$

where  $F$  is the cumulative distribution function for  $\varepsilon$ . Assuming again the logistic distribution for  $F$  with  $\text{Var}(\varepsilon) = \pi^2/3$  we obtain the ordinal logit model. For the ordered logit model, we can define the odds that an outcome is less than or equal to  $m$  versus greater than  $m$  given  $\mathbf{x}$ :

$$(11) \quad \Omega_{\leq m > m}(\mathbf{x}) = \frac{\Pr(y \leq m | \mathbf{x})}{\Pr(y > m | \mathbf{x})} = \exp(\tau_m - \mathbf{x}\boldsymbol{\beta}), \text{ for } m = 1, K-1.$$

The effect of a unitary change in  $x_k$  equals

$$(12) \quad \frac{\Omega_{\leq m | > m}(\mathbf{x}, x_k + 1)}{\Omega_{\leq m | > m}(\mathbf{x}, x_k)} = \exp(-\beta_k)$$

Thus  $\exp(-\beta_k)$  can be interpreted as indicating the factor change in the odds of the outcome of  $y$  being *less than or equal to*  $m$  if  $x_k$  increases by 1, holding all other variables constant. Factor changes in the odds of higher vs. lower values,  $\Omega_{> m | \leq m}(\mathbf{x})$  would equal  $\exp(\beta_k)$ . The  $\exp(\beta_k)$  can be interpreted as the factor change in the odds of choosing inflation with higher importance rather than lower if, say,  $x_k$  increases by one unit, holding the other variables constant.

Since our observations are clustered by country and wave the standard errors have been estimated taking the cluster structure into account.

### 3. Inflation experience and inflation concerns

What determines the inflation concerns expressed in the World Values Survey? This section presents the empirical results. We will first establish a benchmark regression that analyzes the determinants of respondents' first priority, focusing initially on the variation within each country and each wave of the survey, and subsequently broadening the model to simultaneously identify the factors that move response patterns over time. Following this, we will test for the relevant horizon after which inflation memories fade, and test for robustness of our results by analyzing also the second choice in a number of ways.

#### 3.1 Determinants of respondents' first priority

Table 4 provides the results for the benchmark model, showing the odds ratios of picking *maintaining order in the nation* ("order") as opposed to *fighting rising prices* ("inflation") as first priority in the first panel, of answering *giving people more say in important government decisions* ("say") rather than inflation in the second panel, and finally of prioritizing the *protection of freedom of speech* ("freedom of speech") over the fight against inflation in the third panel.<sup>10</sup>

TABLE 4 HERE

For each category, the model is built up consecutively, first only including respondents' inflation experience, and subsequently adding more controls, as discussed in the preceding section. Model (1) provides a first indication that inflation memories matter: while there is no evidence that the odds of picking order over inflation are affected by inflation experience, the odds ratio is significantly below one for say and freedom of speech.<sup>11</sup> For all further extensions of the model, also the odds ratio of order relative to inflation turns out to be significantly different from one. The magnitude of this effect is sizable, and turns out to be rather robust for all three options, and across various model specifications, in the order of 0.9. This implies that the odds for all three political categories relative to inflation decrease by around 10% if an individual moves by one decile in the inflation experience distribution, or by around 30% in the case of a move by three deciles.<sup>12</sup>

All subsequent models control for demographics, with a number of these being relevant determinants for the choices of respondents. Their interpretation is in several cases not straightforward, as they refer to the odds ratios of option pairs. It could therefore be that a control variable has independent effects on the importance an individual attaches to both options, while our estimates would eventually only highlight which effect dominates. This notwithstanding, a number of results can be meaningfully

<sup>10</sup> A variant of each of these models using the inflation experience of individuals in its categorical form is presented in the Appendix.

<sup>11</sup> Note that the stars in all tables indicate whether or not a variable is statistically significantly different from one.

<sup>12</sup> A move of three steps can be considered equivalent to a one-standard deviation change. The number is obtained as follows: An odds ratio of 0.9 is based on a parameter estimate of -0.105. A change in the independent variable of 3 implies an effect on the dependent variable of -0.32, which leads to an odds ratio of 0.729.

interpreted. For instance, females are substantially more likely to mention the fight against rising prices as their priority, with odds ratios in the order of 0.8 for all other choices over inflation. This is entirely consistent with the fact that females tend to have higher inflation expectations and inflation perceptions (Bryan and Venkatu 2001). Accordingly, they should also be more likely to be inflation averse. Being the chief wage earner of a household does affect choice outcomes, although less consistently so. It does not affect the odds of choosing say over inflation; however, and contrary to our priors, chief wage earners are somewhat less likely to see inflation as a concern relative to order and freedom of speech.

With regard to age, we find strong effects that differ across the various options: older respondents are significantly more likely to opt for order as their first priority, while they are also more likely to prioritize the fight against inflation over say and freedom of speech. Although we are differentiating 6 different age categories, the effect of age seems to be well described by a continuous process, given that our estimated odds ratios decline (for say and freedom of speech over inflation) or increase (for order over inflation) nearly monotonically with increasing age<sup>13</sup>. Another important factor relates to the education of respondents: the higher their level of education, the larger their tendency to prioritize the political goals. Also here, effects are not only statistically significant, but also quantitatively large, with odds ratios of 2 and 3 for say over inflation and freedom of speech over inflation, respectively.

Also income affects the answer probabilities in a significant way. While the model is estimated allowing for different slope coefficients in each country (by interacting the income variable with the country fixed effects), for presentational ease, Table 4 only reports the *average* effect across countries. Only little information is lost in that regard, given that the effect has the same direction in all countries, and is statistically significant in the vast majority of them. Accordingly, it holds that on average as well as in practically every country in our sample, higher income tends to reduce the importance attached to fighting rising prices relative to order and say (consistent with earlier results in the literature, e.g. Easterly and Fischer, 2001), whereas it lowers the tendency to prioritize freedom of speech over fighting rising prices.

Moving on to the next set of variables, which relate to the role of politics, we find an intriguing effect of political opinions on survey responses. More conservative respondents tend to prioritize order, whereas they are less likely to prefer freedom of speech or say over the fight against inflation. The magnitude of this effect is sizable, with odds ratios of around 1.1 for order relative to inflation, and of around 0.9 to 0.95 for the other combinations. Accordingly, the odds for order over inflation rise by around 10% if an individual moves political views by one notch, and by around 20% in the case of a one standard-deviation move of 2 points.

As expected, more politically-minded individuals are much more likely to prioritize the political choices over inflation: those who never discuss political issues, for instance, have 15% and 60% smaller odds ratios for order over inflation and freedom of speech or say over inflation, respectively, than those respondents with frequent political discussions.

All except the first model include as possible determinant the respondents' last 15 years' experience of anti-government demonstrations, which does indeed affect the answer patterns in a statistically significant way, and with a non-negligible, yet not overly large magnitude: a one-standard deviation change (of around 4) changes the odds ratio by around 10 to 20%, in the expected direction: having experienced more political unrest increases the likelihood of choosing the political priorities over inflation.

Another addition to the model, included in all specifications as of (3), relates to the experience of hyperinflation. Having lived through such drastic episodes (remember, hyperinflation is defined for annual inflation rates larger or equal to 200%) has lasting effects on respondents' choices: opting for the

---

<sup>13</sup> These findings are robust if we include cohorts instead of age in our model: earlier cohorts are more likely to prioritize order over inflation than the more recently born cohorts, whereas the latter are more likely to prioritize say or freedom of speech over inflation than the earlier ones.

fight against inflation is much more likely, with odds ratios of around 0.8 for order relative to inflation, of around 0.6 for say versus inflation, and of around 0.7 for freedom of speech versus inflation. It is important to note that these effects come on top of the concern about current inflation, and are exerting effects on respondents' priorities despite the hyperinflation experience having been very long ago. Varying the definition of hyperinflation to more extreme levels leads to substantially larger effects, which are furthermore estimated to be extremely statistically significant (despite the fact that they are estimated on increasingly fewer observations). Setting the threshold for hyperinflation to 400% p.a. (which leaves 443 respondents with such an experience in the sample), we find odds ratios of around 0.7 for order relative to inflation, and of around 0.5 for say versus inflation and for freedom of speech versus inflation. An even stricter definition of, say, 5000% p.a. (which leaves 40 respondents with such a dramatic experience in the sample) generates odd ratios of 0.4 for order relative to inflation, of 0.3 for say versus inflation, and a stunningly low 0.05 for freedom of speech versus inflation.<sup>14</sup>

As argued above, it is crucial to properly control for current events or developments that can affect the choice of respondents. Models (1) to (3) do so in the most stringent way, by including country fixed effects, wave fixed effects, as well as country-wave fixed effects. This eliminates all effects that vary across countries, over time for all countries, and over time for a given country. As a consequence, all other determinants explain only the remaining variation, i.e. they relate to within-country differences in response patterns for a given survey wave.

While this is the most stringent way to ensure that our results are not driven by concurrent events, we would like to investigate to what extent current conditions can explain the variation across waves, as this allows testing whether the declining importance attached to price stability over time is related to the macroeconomic and political conditions prevailing at the time of the survey. For that purpose, we remove the country-wave fixed effects in models (4) and (5), leaving only wave fixed effects and country fixed effects, and subsequently removing also the wave fixed effects in models (6) and (7).<sup>15</sup>

Current economic conditions (as measured by the maximum annual inflation rate over the last 5 years and the lowest annual GDP growth rate<sup>16</sup> recorded over the last 5 years prior to the survey) move response patterns in the expected direction: higher recent inflation leads more respondents to be concerned about inflation developments, and lower recent GDP growth implies that inflation is regarded as less of an issue than giving people more say in government decisions.

Current political conditions have less of an effect, although suggesting an interesting pattern: whereas having been confronted with many anti-government demonstrations earlier in life leads respondents to give high priority to giving people more say, and to protecting freedom of speech, more recent demonstrations lead respondents to favor maintaining order in the nation over inflation, but does not affect the relative likelihood of choosing freedom of speech or say.

---

<sup>14</sup> The addition of a similar dummy variable that denotes whether or not a respondent has lived through deflationary periods (defined as negative annual inflation rates over two – or alternatively four – consecutive years) does not lead to statistically significant effects, while leaving all other results unaffected. The absence of any such effect might arise due to the one-sided formulation of the survey question, which does not relate to the *stabilization* of prices, but rather the fight against *rising* prices.

<sup>15</sup> For brevity, we do not report the individual country fixed effects. Given the widespread belief that there is a particularly strong inflation aversion in the German society, we tested whether the fixed effect for Germany is statistically different from the average of the fixed effects of all other countries in our sample. This is indeed the case; while the magnitude depends somewhat on the precise model, we find that the average of the countries' fixed effects (relative to Germany as the base category) is larger than 1, for all the three odds we examine - order, say and freedom of speech over inflation. The difference is statistically significant, often at the 1% level, and coefficients range in between 1.3 and 2.2, suggesting that Germans are considerably more likely to prioritize inflation over the alternative options than citizens of the other countries.

<sup>16</sup> GDP growth rates are calculated based on PPP-adjusted GDP data as provided by the OECD, to allow for comparable figures across countries.



A final test in this modeling framework, reported in columns (5) and (7), investigates the role that central bank policies might play in mitigating inflation concerns of the general public. Over the recent decade, inflation targeting has become an increasingly popular monetary policy framework. Inflation targeting comprises a publicly announced inflation target (which has generally helped central banks in anchoring inflation expectations), as well as a particular emphasis on communication (which might contribute to making the central bank better known and above all better understood by the general public). It is thus an interesting hypothesis whether inflation targeting mitigates concerns about price stability in the public.<sup>17</sup> There is no clear theoretical prior – agents in inflation targeting countries might be more aware about the importance to fight rising prices, being sensitized by corresponding central bank communication, or they might see inflation as less of a concern, if they trust that the central bank properly takes care of the problem. The expected sign is therefore ambiguous, and it remains an empirical issue which effect prevails. However, it should be stressed that in both cases, inflation targeting central banks seem to have managed to get through to the general public, by either raising their inflation awareness, or by building trust in the central bank's determination to fight inflation. A significant effect in either direction would therefore suggest that inflation targeting does affect the attitudes of the general public.

Looking at the results contained in Table 4, it is evident that the second effect prevails: the introduction of inflation targeting lowers inflation concerns in the general public, to a non-negligible extent: the odds ratio for picking order over inflation is estimated significantly at around 1.4 to 1.7. Note that this effect comes on top of a possible inflation-reduction achieved by inflation targeting central banks, given that the model controls for the recent inflation performance. A second point to note is that the model contains country-fixed effects, such that the coefficient on inflation targeting cannot be interpreted as a differential effect between targeters and non-targeters. Rather, it refers exclusively to the comparison across time within given countries, prior to and after the introduction of inflation targeting.

A first robustness test for these results is contained in Appendix Table A2, where the sample of countries is split into the 15 countries belonging to the European Union, and all other countries. The pooling of countries might be problematic if they are too heterogeneous, as then the restriction of all parameters to be equal across countries was not plausible. Although we have restricted our sample to industrialized countries, such a concern could arise, for instance, because the sample includes Japan, which has experienced deflation, as well as Iceland, which has seen comparatively high levels of inflation relative to the rest of the sample. Homogeneity might therefore be more easily acceptable for the subset of European Union countries (especially given that we do not include the Eastern European countries in the sample). Table A2 provides the corresponding estimates, and shows that results are robust to the sample split. The only exception relates to the role of inflation targeting, which for the EU countries – as before – implies a mitigation of inflation concerns, whereas for the non-EU countries, the introduction of inflation targeting seems to have reduced the odds of picking order relative to inflation. As mentioned above, there is no clear prior as to the sign of the effect, whereas the existence of any effect signals that the communication of an inflation target is capable of affecting the views of the general public.

Taken together, these results suggest that memories of high inflation can heighten inflation concerns of economic agents, in a statistically and economically significant fashion. In particular the experience of hyperinflation triggers a long-lasting inflation aversion among individuals (although this effect has been estimated on very few observations only). It is furthermore apparent that the reduced importance attached to fighting rising prices in more recent years is at least partially driven by a favorable concurrent inflation environment. A number of stylized facts that have been discovered in earlier work are replicated in this sample, namely the increased inflation concerns of females and the poor. Finally,

---

<sup>17</sup> For a survey on the literature on central bank communication, including an assessment of the evidence on the effectiveness of inflation targeting, see Blinder et al. (2008). We have defined countries as inflation targeters as follows: Australia in the survey wave of 1996, Canada in 2000, Spain in 1996, Finland in 1996, United Kingdom in 1996 and 2000, New Zealand in 1996, Sweden in 1996 and 2000.



central banks can shape the degree to which the general public is concerned about inflation by means of their monetary policy and communication strategies.

### **3.2 The relevant horizon for agents' memories**

In the preceding subsection, agents' experiences had referred to a 15 year horizon. It remains to be seen whether this is the most relevant horizon, or whether inflation memories fade earlier, or last even longer. A first indication that memories might still be well and alive beyond 15 years is given by the fact that agents who lived through hyperinflation continue to be more concerned about inflationary pressures for as long as we observe them in our sample. Note that the hyperinflations took place around 1922-1923 (Austria and Germany) and around 1944-1946 (Greece, Italy and Japan), respectively, and that for the various individuals, in between 55 and 68 years had passed by the time of the survey, such that it is probably fair to say that these extreme events stay in agents' memories, and affect their attitudes, over their entire lifetime.

With less drastic inflation experiences, people are more likely to forget, though, and this is the question we address in this subsection. We will test for the relevant horizon in an indirect way, namely by calculating inflation experiences over different horizons, starting from 5 years until the entire adult lifetime, and by studying which of these variants generates the best statistical fit in our models. Table 5 shows the corresponding results, based on the full models as estimated in column (7) of Table 4. For convenience, we show only the relevant parameters, noting that all other parameters are remarkably robust.

The various horizons turn out to affect the statistical fit only marginally. In terms of the magnitude of odds ratios, an inverse hump shape emerges for order relative to inflation and for say relative to inflation, with the largest effects estimated over the benchmark horizon of 15 years. In contrast, for freedom of speech relative to inflation, a linear pattern is apparent, with the largest effect at the very short end, i.e. at a 5-year horizon. The measures of statistical fit, such as the AIC and BIC criteria, reflect this, and accordingly are minimized for the 10 to 15 year horizon.

TABLES 5 AND 6 HERE

Results with regard to the maximum number of anti-government demonstrations show a very similar picture: as shown in Table 6, we find the largest effects at the 15 year horizon when it comes to say relative to inflation, whereas the effects are maximized for the 10 year horizon with regard to the other two choice sets.

To summarize, the evidence on the relevant horizon suggests that inflation memories fade after approximately 10 to 15 years, if they refer to moderate inflation rates. Having experienced hyperinflation, however, is an extreme event that will last in people's mind, and shape their preferences accordingly.

### **3.3 Determinants of respondents' second priority**

As mentioned above, the relevant question that has been the focus of the analysis so far is followed by another question, where respondents are allowed to pick a second choice, from the same set of options. In this subsection, we will conduct a series of tests that serve as robustness checks, by studying whether the relevant determinants for the first priority can similarly explain the second choice, and by subsequently modeling both choices simultaneously.

In a first step, we re-estimate identical models to the one portrayed in column (7) of Table 4, but with the second priority as dependent variable, and conditioning on the first priority. We will estimate three different models, one for all respondents who have picked order as first choice, another one for all cases where the main priority was freedom of speech, and a third one with those observations where say was the first expressed priority. The only difference compared to our earlier model specification is that we

no longer include a dummy variable for hyperinflation experience – after all, nearly all respondents with such an experience have picked inflation as first choice, thus leaving no meaningful variation in the remaining cases.

#### TABLE 7 HERE

Results are remarkably robust, as shown in columns (1) to (6) in Table 7. As before, the odds ratios for inflation experience (now again at the 15 year horizon, as used in the estimates underlying Table 4) are estimated in the order of 0.9, and significantly so. Recent inflation affects, as above, in particular the odds of order relative to inflation and the odds of giving people more say in important government decision relative to inflation, albeit with much stronger reactions, suggesting that if inflation has been relatively high recently, respondents who have not picked inflation as first priority are considerably more likely to opt for it as second choice than if inflation has been contained over the last years.

Moving on to a simultaneous modeling of the first and second choices, columns (7) and (8) of Table 7 show the results of estimating a logit model (where inflation as first or second priority is modeled as one, and inflation having resulted as neither first nor second choice is equal to zero) and of an ordered logit model (for a variable that is equal to two if inflation is given first priority, equal to one if it is given second priority, and equal to zero otherwise).<sup>18</sup> Note that in this case, we would expect the coefficients for inflation experience to be greater than 1 (in contrast to the multinomial logit models, where the odds of picking inflation were in the denominator, such that a higher likelihood to pick inflation would show up in coefficients smaller than 1). This is indeed what we find, indicating that having experienced higher inflation increases the odds of choosing ‘inflation’, or the odds of choosing inflation with a higher priority rather than a lower one. Furthermore, all other relevant results obtained previously are confirmed also in this specification.

## 4. Conclusions

Inflation outcomes are very likely to, at least partially, reflect the preferences of societies. Without public support, central banks will find it much more difficult to disinflate a high inflation economy, or to prevent inflation from rising in the first place. The different inflation experiences across countries in the 1980s, for instance, have often been explained by variations in the inflation aversion of the general public. In that debate, references have typically been made to the German case, where allegedly public support for the Bundesbank’s anti-inflationary stance was high due to the German experience of hyperinflation in 1923.

This discussion suggests that memories of high inflation are a relevant factor in shaping a society’s preferences. If this is the case, industrialized countries might be about to experience a reduced inflation aversion among their citizens, given the fact that inflation has been moderate over the recent past. Over time, fewer and fewer members of the societies of industrialized countries will have a vivid memory of the great inflation of the 1970s/1980s (and of course even more so of the hyperinflation episodes, which date back much longer) – either because they have not experienced it, or because they forget over time.

This paper has tested for the role of inflation memories in shaping the preferences of economic agents, and has confirmed that such memories do indeed play an important role. While memories of moderately high inflation tend to fade after around 10 to 15 years, the paper has also identified a lasting effect of hyperinflation experiences on individuals. The recent decline in the number of individuals who prioritize the fight against rising prices is therefore most likely not only due to the fact that inflation should indeed be less of a concern in an environment of low and stable inflation rates, but also due to the fading memories of high inflation.

---

<sup>18</sup> All results are robust to using probit and ordered probit models, respectively.

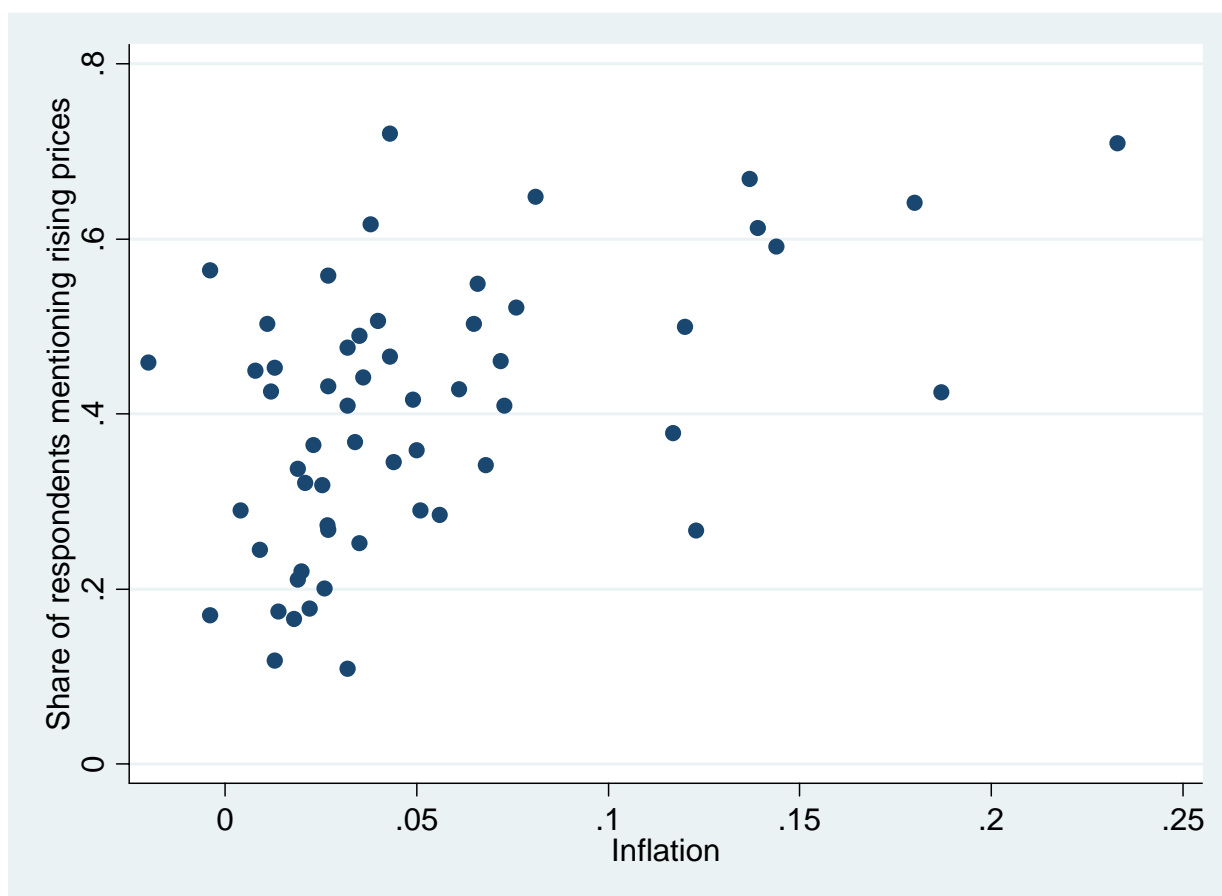
These findings have important implications for central banks. They suggest that public support for their mandate could possibly erode over time, due to the central banks' own successes in taming inflation, thus lowering the sensitivity of the public towards rising prices. The longer central banks have successfully delivered price stability, the more important it is for them to engage in a pro-active communication, especially with the younger generations, about the merits of low and stable inflation. Fortunately, the findings in this paper suggest that central banks have tools at their disposal to shape public views about inflation, as the general public appears to be perceptive to central bank communication.

## References

- Alesina, A., Di Tella, R. and R. MacCulloch (2004). Inequality and Happiness: Are Europeans and Americans Different? *Journal of Public Economics* 88, 2009–2042.
- Beyer, A., Gaspar, V., Gerberding, C. and O. Issing (2009). Opting Out of the Great Inflation: German Monetary Policy After the Break Down of Bretton Wood. ECB Working Paper No. 1020.
- Blanchflower, D.G. (2007). Is Unemployment More Costly Than Inflation? NBER Working Paper No. 13505.
- Blinder, A., Ehrmann, M., Fratzscher, M., de Haan, J. and D.-J. Jansen (2008). Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence. *Journal of Economic Literature* 46(4), 910–945.
- Bryan, M.F. and G. Venkatu (2001). The Demographics of Inflation Opinion Surveys. *Federal Reserve Bank of Cleveland Economic Commentary*, October 2001.
- Cecchetti, S.G. and M. Ehrmann (2002). Does Inflation Targeting Increase Output Volatility? An International Comparison of Policymakers' Preferences and Outcomes, in: N. Loayza and K. Schmidt-Hebbel (eds.). *Monetary Policy: Rules and Transmission Mechanisms*. Central Bank of Chile, 247-274.
- Cheng, S. and J.S. Long (2005). Testing for the IIA in the Multinomial Logit Model. University of Connecticut, Working Paper.
- Christensen, C., van Els, P. and M. van Rooij (2006). Dutch Households' Perceptions of Economic Growth and Inflation. *De Economist* 154, 277-294.
- Cukierman, A. (1992). *Central Bank Strategy, Credibility, and Independence Theory and Evidence*. Cambridge, MA: MIT Press.
- Di Tella, R., MacCulloch, R. and A. Oswald (2003). The Macroeconomics of Happiness. *Review of Economics and Statistics* 85(4), 809–827.
- Easterly, W. and S. Fischer (2001). Inflation and the Poor. *Journal of Money, Credit and Banking* 33(2), 160-178.
- European Central Bank (2005). Consumers' Inflation Perceptions. Still at Odds with Official Statistics? *Monthly Bulletin*, April 2005, 30-32.
- Georgarakos, D. and G. Pasini (2009). Trust, Sociability and Stock Market Participation. Mimeo, Goethe University Frankfurt.
- Guiso, L., Sapienza, P. and L. Zingales (2003). People's Opium. The Economic Effects of Religion. *Journal of Monetary Economics* 50(1), 225–282.
- Guiso, L., Sapienza, P. and L. Zingales (2006). Does Culture Affect Economic Outcomes?. *Journal of Economic Perspectives* 20(2), 23-48.
- Hausman, J. and D. McFadden (1984). Specification Tests for the Multinomial Logit Model. *Econometrica* 52, 1219-1240.
- Hayo, B. (1998). Inflation Culture, Central Bank Independence and Price Stability. *European Journal of Political Economy* 14, 241-263.
- Issing, O. (2005). Why Did the Great Inflation Not Happen in Germany? *Federal Reserve Bank of St. Louis Review*, 87(2), 329-335.
- Inglehart, R. (1997). *Modernization and Postmodernization: Cultural, Economic and Political Change in 43 Societies*. Princeton: Princeton University Press.
- Jen, M.H., Jones, K. and R. Johnston (2009). Global Variations in Health: Evaluating Wilkinson's Income Inequality Hypothesis Using the World Values Survey. *Social Science and Medicine* 68, 643-653.
- Kuzin, V. (2006). The Inflation Aversion of the Bundesbank: A State Space Approach. *Journal of Economic Dynamics and Control* 30, 1671-1686.

- Layard, R., Mayraz, G. and S. Nickell (2008). The Marginal Utility of Income. *Journal of Public Economics* 92, 1846-1857.
- Lelyveld, I. van (1999). Inflation or Unemployment? Who Cares? *European Journal of Political Economy* 15, 463-484.
- Lombardelli, C. and J. Saleheen (2003). Public Expectations of UK Inflation. *Bank of England Quarterly Bulletin* 43(3), 281-290.
- Malmendier, U. and S. Nagel (2007). Depression Babies: Do Macroeconomic Experiences Affect Risk-Taking? Mimeo, UC Berkeley and Stanford University.
- Malmendier, U. and S. Nagel (2009). Learning from Inflation Experiences. Mimeo, UC Berkeley and Stanford University.
- Mankiw, G. and R. Reis (2003). What Measure of Inflation Should a Central Bank Target? *Journal of the European Economic Association* 1(5), 1058-1086.
- Prais, S.J. (1959). Whose Cost of Living? *Review of Economic Studies* 26(2), 126-134.
- Shiller, R.J. (1997). Why Do People Dislike Inflation? In: Romer, C.D. and D.H. Romer (eds). *Reducing Inflation – Motivation and Strategy*. NBER Studies in Business Cycles (30). Chicago: University of Chicago Press, 13-65.
- Small, K.A. and C. Hsiao (1985). Multinomial Logit Specification Tests. *International Economic Review* 26, 619-627.
- Stevenson B. and J. Wolfers (2008) Economic Growth and Subjective Well-Being: Reassessing the Easterlin Paradox, *Brookings Papers on Economic Activity*, Spring 2008, 1-87.
- Tabellini, G. (2009). Culture and Institutions: Economic Development in the Regions of Europe. Forthcoming, *Journal of the European Economic Association*.
- Wolfers, J. (2003). Is Business Cycle Volatility Costly? Evidence From Surveys of Subjective Well-Being. *International Finance* 6(1), 1–26.
- Woodford, M. (2003). *Interest and Prices. Foundations of a Theory of Monetary Policy*. Princeton: Princeton University Press.

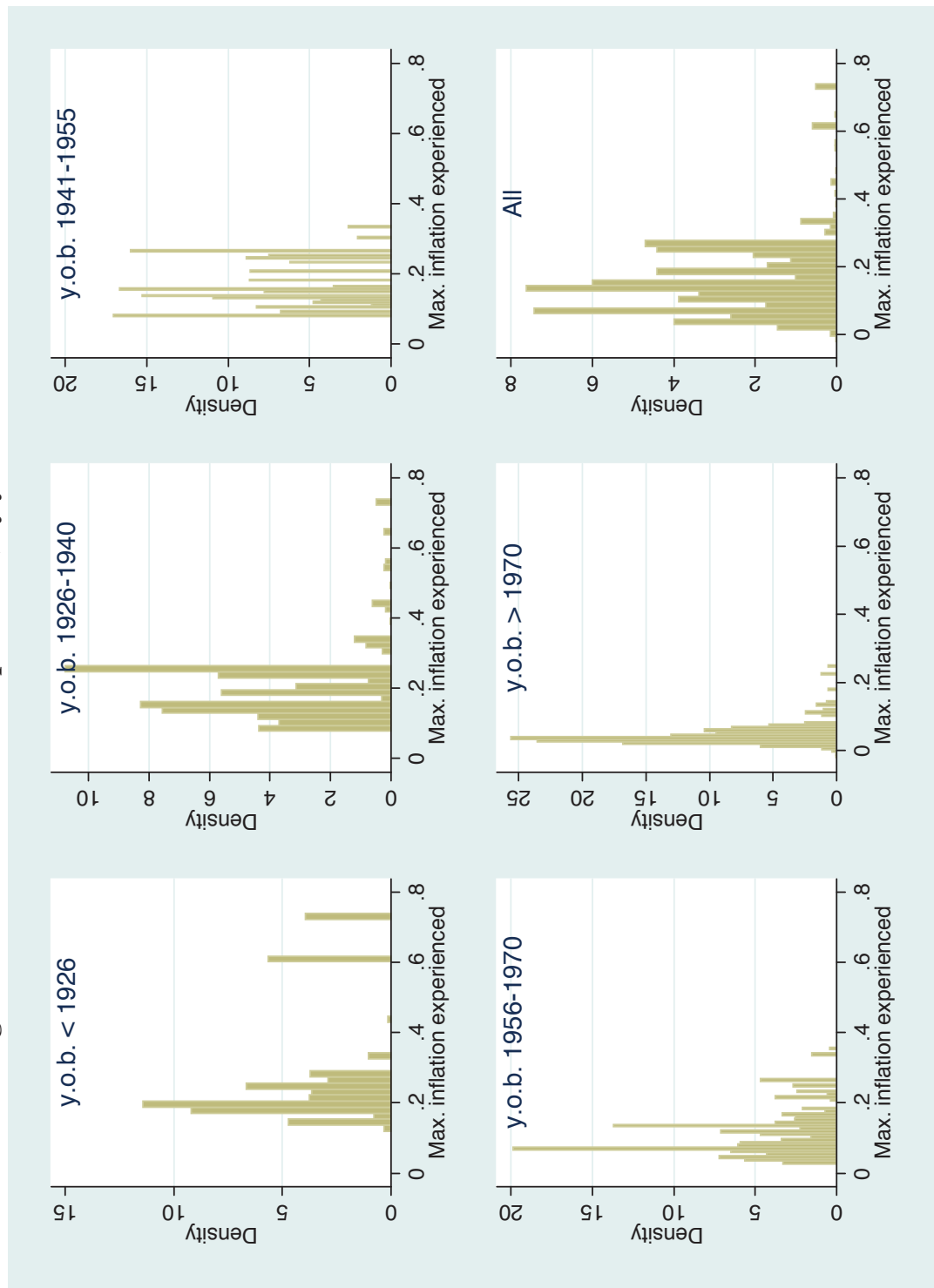
**Figure 1: Inflation concerns and current inflation**



Note: This chart shows, for each country and wave, the relationship between current annual inflation and the share of respondents giving either first or second priority to fighting rising prices.

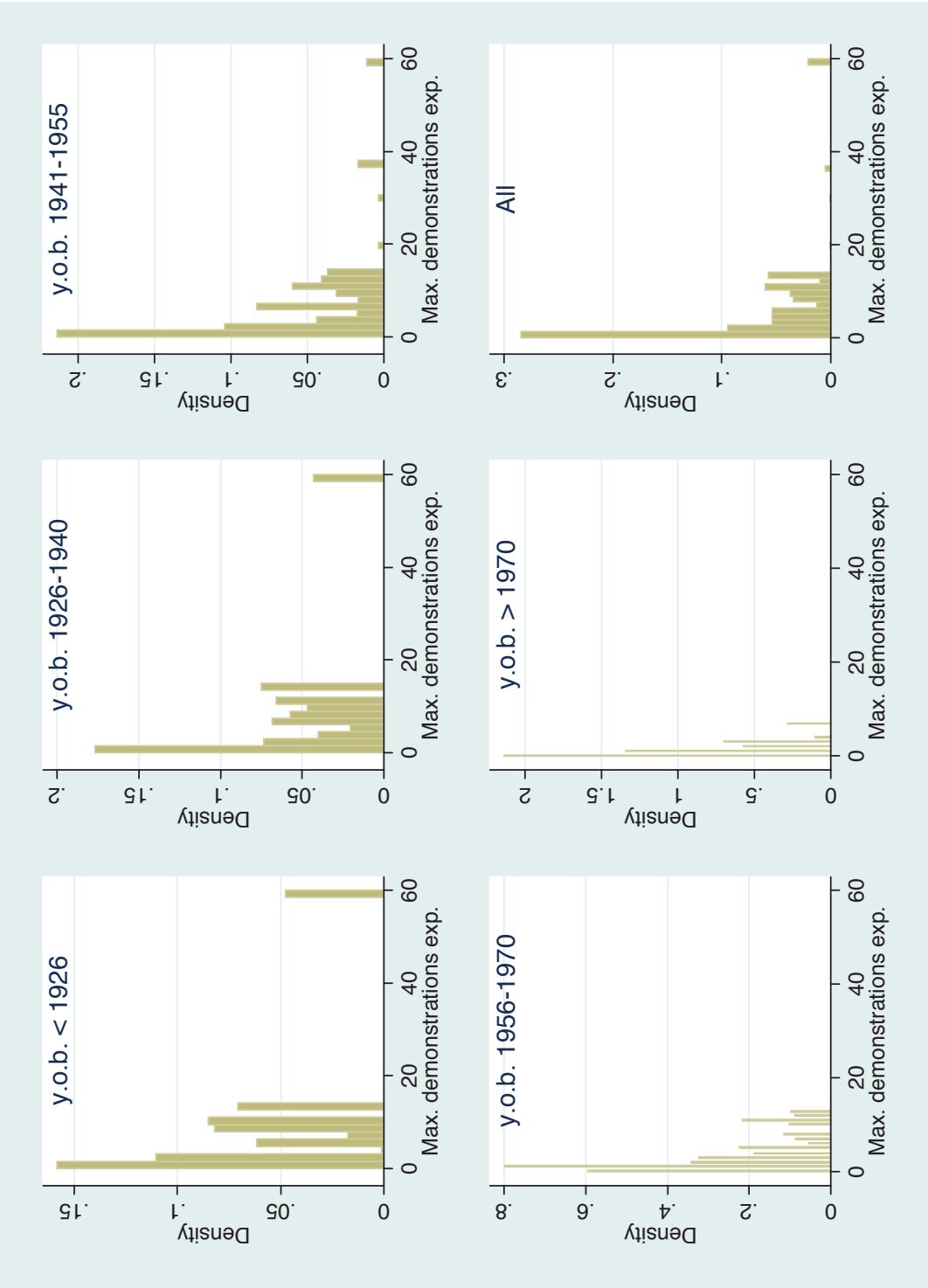


**Figure 2: Lifetime inflation experiences, by year of birth cohorts**



Note: This chart shows histograms of the maximum inflation experience of respondents over their adult lifetime, by year of birth cohorts, and for the entire sample ("All"). Note that values larger than 80% are not shown in order to visualize the distribution. This affects 1,938 observations, exclusively in the first and second cohorts (year of birth prior to 1926, or from 1926-1940).

**Figure 3: Lifetime experience of annual anti-government demonstrations, by year of birth cohorts**



Note: This chart shows histograms of the maximum number of anti-government demonstrations that respondents have experienced in one year of their adult lifetime, by year of birth cohorts, and for the entire sample ("All").

**Table 1: Country and wave coverage**

Area	Country	Observations	Waves			
			1981-1984	1989-1993	1994-1998	1999-2000
<b>European Union</b>	Austria	2,194		1990		1999
	Belgium	2,906	1981	1990		1999
	Denmark	2,468	1981	1990		1999
	Finland	1,990		1990	1996	2000
	France	2,476	1981	1990		1999
	Germany	5,968	1981	1990	1997	1999
	Greece	815				1999
	Ireland	1,868	1981	1990		1999
	Italy	3,135	1981	1990		1999
	Luxembourg	441				1999
	Netherlands	2,300	1981	1990		1999
	Portugal	924		1990		
	Spain	5,472	1981	1990	1995	1999/2000
	Sweden	1,697			1996	1999
UK	2,411	1981	1990		1999	
<b>Other Europeans</b>	Iceland	2,099	1984	1990		1999
	Norway	2,720	1982	1990	1996	
	Switzerland	1,350		1989	1996	
<b>Other countries</b>	Australia	1,220			1995	
	Canada	1,480				2000
	Japan	2,386	1981	1990	1995	2000
	New Zealand	511			1998	
	USA	3,564		1990	1995	1999
<b>Total</b>	23 countries	52,395	12 countries	17 countries	10 countries	18 countries

Note: The table provides an overview of the country coverage, of the available number of observations per country, and of the waves conducted in each country.

**Table 2: Importance attached to fighting rising prices, for various subgroups**

	First priority					Second priority				
	All waves	1981-1984	1989-1993	1994-1999	1999-2000	All waves	1981-1984	1989-1993	1994-1999	1999-2000
<b>All</b>	0.151	0.195	0.176	0.107	0.123	0.241	0.308	0.244	0.193	0.225
<b>By year of birth</b>										
<1926	0.188	0.202	0.203	0.140	0.147	0.306	0.368	0.299	0.211	0.260
1926-1940	0.168	0.213	0.199	0.110	0.127	0.264	0.329	0.259	0.216	0.251
1941-1955	0.151	0.194	0.172	0.112	0.120	0.231	0.282	0.234	0.186	0.220
1956-1970	0.137	0.175	0.153	0.100	0.122	0.222	0.268	0.219	0.191	0.221
>1970	0.116	n.a.	0.140	0.095	0.119	0.197	n.a.	0.215	0.174	0.201
<b>By country</b>										
Germany	0.106	0.122	0.092	0.054	0.157	0.219	0.220	0.176	0.168	0.345
Japan	0.228	0.329	0.264	0.208	0.154	0.349	0.398	0.363	0.351	0.307
Spain	0.206	0.162	0.228	0.209	0.218	0.335	0.426	0.325	0.256	0.289
USA	0.139	n.a.	0.184	0.119	0.098	0.211	n.a.	0.246	0.200	0.175

Note: The table shows, for the total sample, as well as by year of birth and for a few selected countries, the share of respondents giving first (left panel) or second (right panel) priority to fighting rising prices, separately for each survey wave.

**Table 3: Summary statistics**

<b>Variable type</b>	<b>Variable</b>	<b>Obs.</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>
<b>Lifetime experience</b>					
	Maximum annual inflation	52395	184750.7	-0.02	3.02E+08
	Max. of anti-govt. demonstrations p.a	52395	6.297	0	60
	Hyperinflation experience	52395	0.015	0	1
<b>Demographics</b>					
	Female	52395	0.491	0	1
	Chief wage earner	52395	0.575	0	1
<i>Age</i>	18-24	52395	0.134	0	1
	25-34	52395	0.208	0	1
	35-44	52395	0.206	0	1
	45-54	52395	0.170	0	1
	55-64	52395	0.135	0	1
	65+	52395	0.147	0	1
<i>Education</i>	lower	52395	0.375	0	1
	middle	52395	0.423	0	1
	upper	52395	0.202	0	1
<i>Income</i>	low	52395	0.064	0	1
	2	52395	0.097	0	1
	3	52395	0.118	0	1
	4	52395	0.129	0	1
	5	52395	0.128	0	1
	6	52395	0.116	0	1
	7	52395	0.108	0	1
	8	52395	0.087	0	1
	high	52395	0.153	0	1
<b>Role of politics</b>					
<i>Self-position on political scale</i>	left	52395	0.031	0	1
	2	52395	0.036	0	1
	3	52395	0.103	0	1
	4	52395	0.115	0	1
	5	52395	0.292	0	1
	6	52395	0.158	0	1
	7	52395	0.113	0	1
	8	52395	0.090	0	1
	9	52395	0.029	0	1
	right	52395	0.035	0	1
<i>Political discussions w. friends</i>	Frequent	52395	0.177	0	1
	Occasional	52395	0.573	0	1
	Never	52395	0.251	0	1

Note: The table shows summary statistics for the various explanatory variables.

**Table 4: Determinants of survey responses, benchmark model**

Order vs Inflation	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Past experience</i>							
Maximum inflation	1.003 (0.016)	0.966 * (0.018)	0.966 * (0.018)	0.936 *** (0.023)	0.935 *** (0.021)	0.867 *** (0.019)	0.869 *** (0.017)
Number of demonstrations		1.009 (0.013)	1.009 (0.013)	1.054 *** (0.021)	1.053 ** (0.021)	1.044 ** (0.018)	1.045 *** (0.017)
Hyperinflation			0.803 ** (0.085)	0.857 (0.089)	0.831 * (0.085)	0.845 (0.088)	0.804 ** (0.083)
<i>Current conditions</i>							
Max inflation last 5 years				1.475 (1.340)	1.535 (1.454)	0.471 *** (0.096)	0.541 *** (0.098)
Min GDP growth last 5 years				0.880 (1.738)	4.170 (9.830)	0.248 (0.418)	3.921 (5.730)
Max demonstrations last 5 years				1.096 *** (0.033)	1.108 *** (0.037)	1.096 *** (0.023)	1.109 *** (0.028)
Inflation targeting country					1.440 ** (0.210)		1.650 *** (0.223)
<i>Demographics</i>							
Female		0.810 *** (0.035)	0.810 *** (0.035)	0.811 *** (0.035)	0.813 *** (0.035)	0.815 *** (0.036)	0.816 *** (0.036)
Chief wage earner		1.077 (0.050)	1.077 (0.050)	1.080 * (0.047)	1.077 * (0.047)	1.084 * (0.050)	1.078 (0.050)
Age 25-34		0.959 (0.089)	0.959 (0.088)	0.949 (0.085)	0.954 (0.085)	1.137 (0.092)	1.133 (0.093)
Age 35-44		0.986 (0.098)	0.985 (0.098)	0.968 (0.103)	0.975 (0.106)	1.212 ** (0.093)	1.206 ** (0.099)
Age 45-54		1.171 (0.125)	1.170 (0.125)	1.158 (0.121)	1.163 (0.121)	1.449 *** (0.131)	1.437 *** (0.129)
Age 55-64		1.348 ** (0.160)	1.367 *** (0.160)	1.342 *** (0.143)	1.353 *** (0.145)	1.675 *** (0.155)	1.673 *** (0.161)
Age 65+		1.697 *** (0.169)	1.745 *** (0.172)	1.686 *** (0.170)	1.708 *** (0.170)	2.102 *** (0.212)	2.116 *** (0.216)
Middle education		1.271 *** (0.070)	1.271 *** (0.070)	1.249 *** (0.071)	1.252 *** (0.071)	1.245 *** (0.063)	1.252 *** (0.063)
Upper education		1.433 *** (0.121)	1.431 *** (0.121)	1.450 *** (0.128)	1.454 *** (0.129)	1.468 *** (0.127)	1.469 *** (0.127)
Income		1.071 *** (0.006)	1.073 *** (0.006)	1.071 *** (0.007)	1.071 *** (0.007)	1.069 *** (0.006)	1.070 *** (0.006)
<i>Role of politics</i>							
Political self-positioning		1.132 *** (0.015)	1.132 *** (0.015)	1.130 *** (0.015)	1.131 *** (0.015)	1.129 *** (0.015)	1.130 *** (0.015)
Occasional political discussions		1.021 (0.054)	1.021 (0.055)	1.013 (0.054)	1.015 (0.054)	1.015 (0.053)	1.017 (0.054)
No political discussions		0.848 ** (0.065)	0.846 ** (0.065)	0.843 ** (0.064)	0.846 ** (0.065)	0.840 ** (0.064)	0.844 ** (0.065)
Constant	0.528 *** (0.075)	1.830 *** (0.220)	1.808 *** (0.220)	0.436 ** (0.163)	0.332 *** (0.129)	1.240 ** (0.131)	0.769 (0.133)

Note: The table shows results of the multinomial logit model of equation (1) (for the odds of “Maintaining order in the nation” versus “Fighting rising prices”) and presents the exponentiated regression coefficients  $\exp(\beta_{k, m/b})$ . The coefficient for income is the average coefficient across all countries. Numbers in brackets denote standard errors, which allow for clustering across countries. \*\*\*, \*\*, and \* indicate that the exponentiated coefficients are statistically significantly different from one at the 1%, 5%, and 10% level, respectively.



**Table 4 (continued): Determinants of survey responses, benchmark model**

Say vs Inflation	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Past experience</i>							
Maximum inflation	0.906 *** (0.020)	0.952 ** (0.019)	0.952 ** (0.020)	0.939 ** (0.023)	0.939 ** (0.025)	0.897 *** (0.015)	0.897 *** (0.015)
Number of demonstrations		0.998 (0.017)	0.998 (0.017)	1.019 * (0.010)	1.020 ** (0.009)	1.027 * (0.015)	1.028 * (0.015)
Hyperinflation			0.678 *** (0.081)	0.579 *** (0.082)	0.587 *** (0.082)	0.568 *** (0.090)	0.562 *** (0.090)
<i>Current conditions</i>							
Max inflation last 5 years				0.487 (0.289)	0.453 (0.288)	0.364 ** (0.181)	0.372 ** (0.188)
Min GDP growth last 5 years				0.002 * (0.006)	0.001 ** (0.002)	0.002 *** (0.003)	0.002 *** (0.005)
Max demonstrations last 5 years				0.993 (0.020)	0.987 (0.021)	1.013 (0.025)	1.015 (0.027)
Inflation targeting country					0.799 (0.129)		1.092 (0.152)
<i>Demographics</i>							
Female		0.857 *** (0.050)	0.857 *** (0.050)	0.856 *** (0.049)	0.855 *** (0.049)	0.855 *** (0.049)	0.855 *** (0.050)
Chief wage earner		1.048 (0.045)	1.047 (0.045)	1.041 (0.045)	1.042 (0.045)	1.045 (0.046)	1.043 (0.046)
Age 25-34		1.008 (0.086)	1.009 (0.085)	0.998 (0.078)	0.997 (0.080)	1.098 (0.089)	1.097 (0.088)
Age 35-44		0.904 (0.080)	0.904 (0.079)	0.892 (0.074)	0.890 (0.077)	1.003 (0.081)	1.003 (0.081)
Age 45-54		0.930 (0.093)	0.930 (0.092)	0.911 (0.089)	0.910 (0.091)	1.018 (0.098)	1.016 (0.097)
Age 55-64		0.797 * (0.099)	0.811 * (0.097)	0.803 * (0.093)	0.801 * (0.096)	0.893 (0.098)	0.893 (0.098)
Age 65+		0.720 *** (0.084)	0.750 *** (0.082)	0.750 *** (0.080)	0.746 *** (0.084)	0.826 * (0.096)	0.828 (0.096)
Middle education		1.628 *** (0.101)	1.628 *** (0.101)	1.664 *** (0.104)	1.660 *** (0.105)	1.692 *** (0.108)	1.695 *** (0.108)
Upper education		2.227 *** (0.199)	2.223 *** (0.200)	2.273 *** (0.204)	2.271 *** (0.204)	2.317 *** (0.213)	2.320 *** (0.214)
Income		1.011 (0.007)	1.014 ** (0.007)	1.013 * (0.007)	1.013 * (0.007)	1.010 (0.007)	1.010 (0.007)
<i>Role of politics</i>							
Political self-positioning		0.913 *** (0.013)	0.913 *** (0.013)	0.915 *** (0.014)	0.914 *** (0.014)	0.914 *** (0.014)	0.914 *** (0.014)
Occasional political discussions		0.635 *** (0.039)	0.634 *** (0.039)	0.635 *** (0.039)	0.634 *** (0.039)	0.639 *** (0.039)	0.640 *** (0.040)
No political discussions		0.415 *** (0.042)	0.414 *** (0.042)	0.413 *** (0.041)	0.411 *** (0.041)	0.413 *** (0.042)	0.414 *** (0.042)
Constant	1.981 *** (0.387)	28.017 *** (4.153)	27.568 *** (4.079)	8.730 *** (3.164)	10.546 *** (3.376)	12.703 *** (2.162)	11.665 *** (3.190)

Note: The table shows results of the multinomial logit model of equation (1) (for the odds of “Giving people more say” versus “Fighting rising prices”) and presents the exponentiated regression coefficients  $\exp(\beta_k m/b)$ . The coefficient for income is the average coefficient across all countries. Numbers in brackets denote standard errors, which allow for clustering across countries. \*\*\*, \*\*, and \* indicate that the exponentiated coefficients are statistically significantly different from one at the 1%, 5%, and 10% level, respectively.

**Table 4 (continued): Determinants of survey responses, benchmark model**

<b>Freedom of speech vs Inflation</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>
<i>Past experience</i>							
Maximum inflation	0.877 *** (0.023)	0.953 ** (0.020)	0.952 ** (0.020)	0.938 * (0.035)	0.937 * (0.036)	0.910 *** (0.022)	0.909 *** (0.021)
Number of demonstrations		0.988 (0.021)	0.988 (0.021)	1.009 (0.018)	1.010 (0.018)	1.042 * (0.023)	1.043 * (0.023)
Hyperinflation			0.713 (0.167)	0.689 (0.161)	0.693 (0.163)	0.656 * (0.161)	0.648 * (0.160)
<i>Current conditions</i>							
Max inflation last 5 years				0.419 (0.392)	0.384 (0.340)	0.323 (0.316)	0.327 (0.323)
Min GDP growth last 5 years				0.378 (1.376)	0.173 (0.678)	0.027 * (0.052)	0.035 (0.083)
Max demonstrations last 5 years				0.990 (0.044)	0.984 (0.048)	0.971 (0.040)	0.972 (0.043)
Inflation targeting country					0.854 (0.190)		1.059 (0.191)
<i>Demographics</i>							
Female		0.794 *** (0.047)	0.794 *** (0.047)	0.797 *** (0.047)	0.797 *** (0.047)	0.792 *** (0.046)	0.793 *** (0.046)
Chief wage earner		1.129 *** (0.051)	1.129 *** (0.051)	1.127 *** (0.049)	1.128 *** (0.049)	1.113 ** (0.047)	1.111 ** (0.047)
Age 25-34		0.844 * (0.082)	0.844 * (0.081)	0.830 * (0.080)	0.832 * (0.081)	0.853 (0.092)	0.854 (0.092)
Age 35-44		0.728 *** (0.081)	0.727 *** (0.081)	0.714 *** (0.084)	0.715 *** (0.084)	0.741 ** (0.090)	0.742 ** (0.091)
Age 45-54		0.778 ** (0.098)	0.778 ** (0.098)	0.763 ** (0.101)	0.765 ** (0.101)	0.788 (0.124)	0.787 (0.124)
Age 55-64		0.714 *** (0.093)	0.725 ** (0.093)	0.708 *** (0.093)	0.710 *** (0.094)	0.724 ** (0.111)	0.725 ** (0.111)
Age 65+		0.699 *** (0.094)	0.724 ** (0.096)	0.699 *** (0.096)	0.700 ** (0.098)	0.711 ** (0.120)	0.715 ** (0.120)
Middle education		1.890 *** (0.127)	1.889 *** (0.127)	1.831 *** (0.119)	1.828 *** (0.119)	1.904 *** (0.134)	1.906 *** (0.134)
Upper education		3.253 *** (0.318)	3.248 *** (0.318)	3.291 *** (0.332)	3.290 *** (0.333)	3.431 *** (0.359)	3.434 *** (0.360)
Income		0.976 *** (0.008)	0.978 *** (0.008)	0.976 *** (0.008)	0.976 *** (0.008)	0.972 *** (0.009)	0.972 *** (0.009)
<i>Role of politics</i>							
Political self-positioning		0.951 *** (0.014)	0.951 *** (0.014)	0.952 *** (0.015)	0.952 *** (0.015)	0.953 *** (0.015)	0.953 *** (0.015)
Occasional political discussions		0.639 *** (0.037)	0.639 *** (0.038)	0.635 *** (0.037)	0.634 *** (0.037)	0.638 *** (0.038)	0.638 *** (0.038)
No political discussions		0.407 *** (0.046)	0.406 *** (0.046)	0.404 *** (0.045)	0.404 *** (0.044)	0.405 *** (0.046)	0.406 *** (0.046)
Constant	2.424 *** (0.583)	4.890 *** (0.866)	4.819 *** (0.861)	4.350 *** (1.769)	4.999 *** (1.612)	8.073 *** (1.671)	7.648 *** (2.040)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES
Wave fixed effects	YES	YES	YES	YES	YES	NO	NO
Country-wave fixed effects	YES	YES	YES	NO	NO	NO	NO
Number of observations	52395	52395	52395	52395	52395	52395	52395
McFadden's Adj R2	0.058	0.092	0.092	0.088	0.088	0.084	0.084
Cragg-Uhler(Nagelkerke) R2	0.159	0.202	0.202	0.230	0.231	0.221	0.222
AIC	129775	92724	92716	125628	125584	126169	126127
BIC	129802	92937	92929	125841	125796	126382	126340

Note: The table shows results of the multinomial logit model of equation (1) (for the odds of “Protecting freedom of speech” versus “Fighting rising prices”) and presents the exponentiated regression coefficients  $\exp(\beta_{k\ m/b})$ . The coefficient for income is the average coefficient across all countries. Numbers in brackets denote standard errors, which allow for clustering across countries. \*\*\*, \*\*, and \* indicate that the exponentiated coefficients are statistically significantly different from one at the 1%, 5%, and 10% level, respectively.

**Table 5: Horizon of inflation memories**

	5 years	10 years	15 years	20 years	25 years	30 years	Adult life
<b>Order vs Inflation</b>							
Maximum inflation exp.	0.884 *** (0.023)	0.879 *** (0.019)	0.869 *** (0.017)	0.882 *** (0.023)	0.911 *** (0.031)	0.936 ** (0.025)	0.941 *** (0.022)
<b>Say vs Inflation</b>							
Maximum inflation exp.	0.907 *** (0.022)	0.904 *** (0.018)	0.897 *** (0.015)	0.928 *** (0.019)	0.937 ** (0.025)	0.951 ** (0.021)	0.942 *** (0.018)
<b>Freedom of speech vs Inflation</b>							
Maximum inflation exp.	0.886 *** (0.034)	0.907 *** (0.025)	0.909 *** (0.021)	0.939 *** (0.022)	0.954 * (0.026)	0.961 * (0.021)	0.949 ** (0.020)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES
Wave fixed effects	NO	NO	NO	NO	NO	NO	NO
Country-wave fixed effects	NO	NO	NO	NO	NO	NO	NO
Number of observations	52395	52395	52395	52395	52395	52395	52395
McFadden's Adj R2	0.084	0.084	0.084	0.084	0.083	0.083	0.083
Cragg-Uhler(Nagelkerke) R2	0.221	0.222	0.222	0.220	0.219	0.218	0.218
AIC	126185	126128	126127	126237	126327	126376	126375
BIC	126398	126340	126340	126449	126540	126589	126588

Note: The table shows results of the multinomial logit model of equation (1) and presents the exponentiated regression coefficients  $\exp(\beta_{k\ m/b})$ . The specification of the model follows the one of column (7) in Table 4. The models in the different columns vary the horizon over which the inflation experience has been calculated from 5 years prior to the survey to the entire adult life of a respondent. The 15 year horizon corresponds to the one chosen in the benchmark models of Table 4. Numbers in brackets denote standard errors, which allow for clustering across countries. \*\*\*, \*\*, and \* indicate that the exponentiated coefficients are statistically significantly different from one at the 1%, 5%, and 10% level, respectively.

**Table 6: Horizon of memories of political unrest**

	5 years	10 years	15 years	20 years	25 years	30 years	Adult life
<b>Order vs Inflation</b>							
Number of demonstrations	1.012 (0.035)	1.072 *** (0.017)	1.045 *** (0.017)	1.024 * (0.013)	1.006 (0.008)	1.002 (0.004)	1.002 (0.003)
<b>Say vs Inflation</b>							
Number of demonstrations	0.949 (0.044)	1.017 (0.036)	1.028 * (0.015)	1.008 (0.016)	1.007 * (0.004)	1.006 *** (0.002)	1.006 *** (0.002)
<b>Freedom of speech vs Inflation</b>							
Number of demonstrations	0.926 *** (0.025)	1.058 (0.042)	1.043 * (0.023)	1.003 (0.018)	1.002 (0.004)	1.003 (0.002)	1.005 *** (0.002)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES
Wave fixed effects	NO	NO	NO	NO	NO	NO	NO
Country-wave fixed effects	NO	NO	NO	NO	NO	NO	NO
Number of observations	52395	52395	52395	52395	52395	52395	52395
McFadden's Adj R2	0.084	0.085	0.084	0.084	0.084	0.084	0.084
Cragg-Uhler(Nagelkerke) R2	0.222	0.222	0.222	0.222	0.221	0.221	0.222
AIC	126126.6	126105.6	126127.4	126143.9	126153.8	126152.4	126148.3
BIC	126339.4	126318.4	126340.2	126356.7	126366.6	126365.2	126361.1

Note: The table shows results of the multinomial logit model of equation (1) and presents the exponentiated regression coefficients  $\exp(\beta_{k\ m/b})$ . The specification of the model follows the one of column (7) in Table 4. The models in the different columns vary the horizon over which the experience of political unrest has been calculated from 5 years prior to the survey to the entire adult life of a respondent. The 15 year horizon corresponds to the one chosen in the benchmark models of Table 4. Numbers in brackets denote standard errors, which allow for clustering across countries. \*\*\*, \*\*, and \* indicate that the exponentiated coefficients are statistically significantly different from one at the 1%, 5%, and 10% level, respectively.

**Table 7: Modeling ‘inflation’ as 2<sup>nd</sup> choice, and the incidence of picking ‘inflation’**

	1st choice "Order"		1st choice "Say"		1st choice "Free speech"		Logit model	Ordered logit model
	Say vs Inflation	Free speech vs Infl.	Order vs Inflation	Free speech vs Infl.	Order vs Inflation	Say vs Inflation		
<i>Past experience</i>								
Maximum inflation	0.895 *** (0.015)	0.905 *** (0.021)	0.876 *** (0.021)	0.947 ** (0.021)	0.902 *** (0.021)	0.945 * (0.029)	1.115 *** (0.015)	1.118 *** (0.014)
Number of demonstrations	0.983 (0.018)	1.010 (0.028)	1.013 (0.016)	1.005 (0.013)	0.990 (0.019)	0.989 (0.014)	0.99 (0.016)	0.979 (0.016)
<i>Current conditions</i>								
Max inflation last 5 years	0.257 ** (0.137)	0.617 (0.430)	0.218 *** (0.032)	0.866 (0.601)	0.060 *** (0.033)	0.144 ** (0.114)	2.849 * (1.736)	2.539 * (1.293)
Min GDP growth last 5 years	2.365 (6.428)	56.525 (182.320)	0.032 (0.078)	0.012 (0.039)	0.162 (0.508)	0.014 (0.047)	4.102 (7.437)	4.630 (7.163)
Max demonstrations last 5 years	1.054 ** (0.022)	0.969 (0.035)	1.098 *** (0.039)	1.009 (0.029)	1.041 * (0.025)	1.026 (0.032)	0.981 (0.026)	0.970 (0.022)
Inflation targeting country	1.663 ** (0.335)	2.462 *** (0.735)	1.068 (0.168)	1.394 (0.322)	1.750 * (0.531)	1.562 ** (0.313)	0.647 *** (0.086)	0.666 *** (0.076)
<i>Demographics</i>								
Female	0.880 *** (0.043)	0.813 *** (0.053)	0.797 *** (0.054)	0.785 *** (0.031)	0.923 (0.053)	1.082 (0.080)	1.209 *** (0.042)	1.200 *** (0.038)
Chief wage earner	0.980 (0.043)	1.000 (0.056)	0.985 (0.079)	1.048 (0.071)	1.144 * (0.087)	1.203 ** (0.110)	0.953 ** (0.022)	0.946 ** (0.022)
Age 25-34	1.266 ** (0.120)	1.038 (0.127)	1.159 (0.120)	0.866 (0.087)	1.188 (0.143)	0.894 (0.125)	0.952 (0.070)	0.961 (0.069)
Age 35-44	1.149 (0.118)	1.010 (0.157)	1.278 *** (0.107)	0.830 (0.111)	1.248 (0.220)	0.974 (0.173)	0.989 (0.083)	0.991 (0.081)
Age 45-54	1.122 (0.100)	1.019 (0.134)	1.390 ** (0.181)	0.905 (0.149)	1.314 (0.227)	1.011 (0.159)	0.939 (0.096)	0.932 (0.092)
Age 55-64	0.985 (0.115)	1.099 (0.178)	1.823 *** (0.304)	1.026 (0.160)	1.674 *** (0.268)	0.962 (0.150)	0.920 (0.095)	0.919 (0.089)
Age 65+	1.008 (0.110)	1.152 (0.183)	1.386 ** (0.194)	0.783 (0.151)	1.430 *** (0.197)	0.557 *** (0.092)	0.977 (0.112)	0.921 (0.097)
Middle education	1.278 *** (0.056)	1.479 *** (0.083)	1.177 ** (0.079)	1.462 *** (0.099)	0.919 (0.062)	1.152 * (0.088)	0.676 *** (0.028)	0.668 *** (0.029)
Upper education	1.461 *** (0.081)	1.749 *** (0.177)	1.238 ** (0.124)	2.260 *** (0.180)	1.138 (0.109)	1.684 *** (0.164)	0.491 *** (0.033)	0.483 *** (0.033)
Income	1.000 (0.008)	1.068 *** (0.008)	1.115 *** (0.011)	1.042 *** (0.008)	1.235 *** (0.013)	1.132 *** (0.011)	0.950 *** (0.005)	0.946 *** (0.005)
<i>Role of politics</i>								
Political self-positioning	0.988 (0.009)	1.012 (0.009)	1.110 *** (0.011)	0.951 *** (0.016)	1.164 *** (0.022)	0.922 *** (0.014)	1.002 (0.009)	0.997 (0.008)
Occasional political discussions	0.841 *** (0.046)	0.768 *** (0.049)	0.923 (0.048)	0.731 *** (0.039)	0.812 * (0.089)	0.619 *** (0.055)	1.384 *** (0.047)	1.359 *** (0.049)
No political discussions	0.622 *** (0.058)	0.573 *** (0.050)	0.833 ** (0.067)	0.503 *** (0.045)	0.828 * (0.090)	0.455 *** (0.054)	1.962 *** (0.116)	1.896 *** (0.122)
Constant	3.510 *** (0.931)	1.484 (0.541)	0.881 (0.177)	3.633 *** (0.928)	0.393 *** (0.119)	3.875 *** (1.142)	0.313 *** (0.055)	
$\tau_1$								2.822 *** (0.444)
$\tau_2$								11.539 *** (1.805)
Country fixed effects	YES		YES		YES		YES	YES
Wave fixed effects	NO		NO		NO		NO	NO
Country-wave fixed effects	NO		NO		NO		NO	NO
Number of observations	19359		14634		9584		52395	52395
McFadden's Adj R2	0.060		0.061		0.064		0.096	0.072
Cragg-Uhler(Nagelkerke) R2	0.152		0.157		0.169		0.167	0.151
AIC	39683		29354		18201		61860	89561
BIC	39872		29536		18373		62020	89729

Note: Results in the first 6 columns are based on multinomial logit models (eq. 1), modeling the 2<sup>nd</sup> choice of respondents, conditional on the 1<sup>st</sup> choice. Results in column 7 are based on a logit model (eq. 7), and explain whether or not a respondent has picked inflation as 1<sup>st</sup> or 2<sup>nd</sup> priority. Column 8 presents results of an ordered logit model (eq. 11), explaining whether a respondent has picked inflation as 1<sup>st</sup> priority, as 2<sup>nd</sup> priority, or not at all. All coefficients are odds ratios. Numbers in brackets denote standard errors, which allow for clustering across countries. \*\*\*, \*\*, and \* indicate that the exponentiated coefficients are statistically significantly different from one at the 1%, 5%, and 10% level, respectively.

**Appendix: Table A1: Determinants of survey responses, inflation experience in categorical form**

Order vs Inflation	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Past experience</i>							
Maximum inflation - 2nd decile	1.057 (0.057)	0.845 ** (0.060)	0.844 ** (0.060)	0.614 *** (0.083)	0.634 *** (0.089)	0.687 *** (0.082)	0.699 *** (0.072)
Maximum inflation - 3rd decile	0.954 (0.083)	0.788 ** (0.090)	0.786 ** (0.090)	0.643 *** (0.096)	0.638 *** (0.096)	0.594 *** (0.075)	0.573 *** (0.071)
Maximum inflation - 4th decile	1.083 (0.102)	0.916 (0.089)	0.911 (0.089)	1.023 (0.126)	1.010 (0.122)	0.751 ** (0.102)	0.743 ** (0.103)
Maximum inflation - 5th decile	1.139 (0.146)	0.868 (0.115)	0.861 (0.114)	0.673 *** (0.088)	0.661 *** (0.087)	0.457 *** (0.068)	0.452 *** (0.060)
Maximum inflation - 6th decile	1.068 (0.146)	0.806 (0.131)	0.800 (0.133)	0.683 *** (0.092)	0.678 *** (0.085)	0.513 *** (0.038)	0.505 *** (0.038)
Maximum inflation - 7th decile	1.127 (0.117)	0.802 * (0.098)	0.794 * (0.097)	0.631 *** (0.103)	0.618 *** (0.101)	0.385 *** (0.071)	0.376 *** (0.065)
Maximum inflation - 8th decile	1.266 * (0.163)	0.866 (0.146)	0.856 (0.145)	0.542 *** (0.099)	0.529 *** (0.100)	0.306 *** (0.072)	0.297 *** (0.062)
Maximum inflation - 9th decile	0.990 (0.156)	0.687 ** (0.122)	0.690 ** (0.125)	0.549 *** (0.088)	0.547 *** (0.084)	0.290 *** (0.040)	0.306 *** (0.025)
Maximum inflation - 10th decile	1.109 (0.173)	0.735 (0.138)	0.722 * (0.134)	0.409 *** (0.077)	0.412 *** (0.080)	0.220 *** (0.050)	0.232 *** (0.048)
Number of demonstrations		1.010 (0.014)	1.011 (0.014)	1.071 *** (0.017)	1.068 *** (0.017)	1.048 *** (0.018)	1.047 *** (0.017)
Hyperinflation			0.808 ** (0.087)	0.843 * (0.081)	0.823 ** (0.081)	0.847 * (0.084)	0.795 ** (0.081)
<i>Current conditions</i>							
Max inflation last 5 years				2.751 (2.619)	2.623 (2.627)	0.524 *** (0.085)	0.601 *** (0.091)
Min GDP growth last 5 years				0.946 (1.905)	3.091 (7.465)	0.293 (0.582)	6.523 (11.456)
Max demonstrations last 5 years				1.090 *** (0.029)	1.097 *** (0.030)	1.094 *** (0.022)	1.105 *** (0.028)
Inflation targeting country					1.247 (0.188)		1.722 *** (0.193)
<i>Demographics</i>							
Female		0.810 *** (0.035)	0.810 *** (0.035)	0.812 *** (0.035)	0.812 *** (0.035)	0.816 *** (0.036)	0.817 *** (0.036)
Chief wage earner		1.078 * (0.049)	1.077 (0.049)	1.080 * (0.048)	1.078 * (0.048)	1.090 * (0.052)	1.082 * (0.051)
Age 25-34		0.964 (0.091)	0.964 (0.090)	0.948 (0.085)	0.953 (0.084)	1.162 ** (0.087)	1.155 * (0.086)
Age 35-44		1.000 (0.104)	0.999 (0.103)	0.987 (0.097)	0.994 (0.097)	1.258 *** (0.100)	1.248 *** (0.103)
Age 45-54		1.188 (0.130)	1.187 (0.130)	1.176 * (0.115)	1.183 * (0.113)	1.503 *** (0.130)	1.486 *** (0.124)
Age 55-64		1.367 ** (0.168)	1.385 *** (0.168)	1.365 *** (0.146)	1.376 *** (0.146)	1.737 *** (0.140)	1.730 *** (0.148)
Age 65+		1.720 *** (0.174)	1.767 *** (0.176)	1.727 *** (0.162)	1.746 *** (0.160)	2.190 *** (0.199)	2.203 *** (0.204)
Middle education		1.270 *** (0.070)	1.270 *** (0.070)	1.252 *** (0.074)	1.253 *** (0.075)	1.251 *** (0.066)	1.259 *** (0.066)
Upper education		1.430 *** (0.122)	1.428 *** (0.122)	1.450 *** (0.130)	1.451 *** (0.130)	1.479 *** (0.129)	1.480 *** (0.129)
Income		1.072 *** (0.006)	1.073 *** (0.006)	1.073 *** (0.008)	1.073 *** (0.008)	1.070 *** (0.007)	1.071 *** (0.007)
<i>Role of politics</i>							
Political self-positioning -right		1.132 *** (0.015)	1.132 *** (0.015)	1.130 *** (0.015)	1.130 *** (0.015)	1.129 *** (0.015)	1.129 *** (0.015)
Occasional political discussions		1.021 (0.054)	1.020 (0.055)	1.017 (0.054)	1.018 (0.054)	1.018 (0.053)	1.021 (0.054)
No political discussions		0.846 ** (0.064)	0.844 ** (0.065)	0.844 ** (0.064)	0.845 ** (0.064)	0.844 ** (0.063)	0.848 ** (0.064)
Constant	1.472 *** (0.204)	1.912 *** (0.249)	1.879 *** (0.244)	0.326 *** (0.137)	0.288 *** (0.118)	1.120 (0.222)	0.700 (0.154)

Note: See notes to table 4. Inflation experience enters this model in its categorical form.

**Table A1 (continued): Determinants of survey responses, inflation experience in categorical form**

Say vs Inflation	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Past experience</i>							
Maximum inflation - 2nd decile	0.845 (0.111)	0.901 (0.129)	0.900 (0.127)	0.750 * (0.127)	0.706 * (0.129)	0.843 (0.112)	0.841 (0.112)
Maximum inflation - 3rd decile	0.808 * (0.099)	0.948 (0.132)	0.944 (0.132)	0.771 * (0.116)	0.780 * (0.116)	0.689 *** (0.090)	0.680 *** (0.088)
Maximum inflation - 4th decile	0.948 (0.123)	0.986 (0.116)	0.978 (0.113)	0.944 (0.091)	0.966 (0.090)	0.767 *** (0.066)	0.759 *** (0.065)
Maximum inflation - 5th decile	0.711 *** (0.067)	0.888 (0.114)	0.879 (0.113)	0.684 *** (0.070)	0.704 *** (0.076)	0.565 *** (0.053)	0.559 *** (0.053)
Maximum inflation - 6th decile	0.752 ** (0.108)	0.894 (0.135)	0.887 (0.137)	0.796 * (0.100)	0.806 * (0.094)	0.710 *** (0.079)	0.708 *** (0.080)
Maximum inflation - 7th decile	0.701 *** (0.095)	0.870 (0.130)	0.859 (0.127)	0.659 ** (0.124)	0.683 ** (0.130)	0.491 *** (0.103)	0.484 *** (0.100)
Maximum inflation - 8th decile	0.649 *** (0.091)	0.843 (0.130)	0.830 (0.128)	0.776 (0.126)	0.806 (0.133)	0.537 *** (0.085)	0.524 *** (0.082)
Maximum inflation - 9th decile	0.386 *** (0.062)	0.589 *** (0.098)	0.592 *** (0.097)	0.468 *** (0.075)	0.474 *** (0.080)	0.305 *** (0.034)	0.304 *** (0.035)
Maximum inflation - 10th decile	0.424 *** (0.114)	0.731 (0.178)	0.714 (0.172)	0.581 ** (0.142)	0.579 ** (0.142)	0.361 *** (0.095)	0.361 *** (0.093)
Number of demonstrations		0.993 (0.022)	0.994 (0.022)	1.022 * (0.013)	1.026 ** (0.012)	1.028 (0.020)	1.028 (0.020)
Hyperinflation			0.693 *** (0.084)	0.624 *** (0.084)	0.642 *** (0.085)	0.621 *** (0.086)	0.617 *** (0.090)
<i>Current conditions</i>							
Max inflation last 5 years				0.620 (0.236)	0.661 (0.267)	0.389 ** (0.177)	0.394 ** (0.180)
Min GDP growth last 5 years				0.004 * (0.012)	0.001 ** (0.002)	0.004 *** (0.007)	0.004 *** (0.009)
Max demonstrations last 5 years				1.001 (0.019)	0.990 (0.018)	1.024 (0.028)	1.023 (0.029)
Inflation targeting country					0.681 ** (0.105)		1.035 (0.146)
<i>Demographics</i>							
Female		0.857 *** (0.050)	0.857 *** (0.050)	0.856 *** (0.050)	0.856 *** (0.050)	0.856 *** (0.050)	0.856 *** (0.051)
Chief wage earner		1.050 (0.045)	1.050 (0.045)	1.043 (0.045)	1.046 (0.045)	1.046 (0.046)	1.044 (0.046)
Age 25-34		1.002 (0.089)	1.002 (0.088)	1.001 (0.077)	0.990 (0.078)	1.120 (0.094)	1.120 (0.092)
Age 35-44		0.904 (0.083)	0.902 (0.082)	0.905 (0.072)	0.894 (0.073)	1.031 (0.087)	1.031 (0.086)
Age 45-54		0.928 (0.093)	0.927 (0.093)	0.923 (0.082)	0.914 (0.084)	1.048 (0.097)	1.047 (0.096)
Age 55-64		0.794 * (0.101)	0.807 * (0.100)	0.810 * (0.089)	0.800 * (0.093)	0.913 (0.100)	0.914 (0.099)
Age 65+		0.715 *** (0.082)	0.744 *** (0.080)	0.757 *** (0.070)	0.742 *** (0.075)	0.843 * (0.087)	0.844 (0.088)
Middle education		1.626 *** (0.101)	1.626 *** (0.101)	1.657 *** (0.100)	1.651 *** (0.102)	1.680 *** (0.103)	1.681 *** (0.104)
Upper education		2.215 *** (0.200)	2.211 *** (0.200)	2.276 *** (0.200)	2.269 *** (0.201)	2.325 *** (0.211)	2.328 *** (0.211)
Income		1.012 * (0.007)	1.014 ** (0.007)	1.013 * (0.007)	1.013 * (0.007)	1.009 (0.008)	1.009 (0.008)
<i>Role of politics</i>							
Political self-positioning -right		0.913 *** (0.013)	0.913 *** (0.013)	0.914 *** (0.013)	0.914 *** (0.013)	0.914 *** (0.014)	0.914 *** (0.014)
Occasional political discussions		0.634 *** (0.038)	0.634 *** (0.039)	0.636 *** (0.039)	0.634 *** (0.038)	0.639 *** (0.039)	0.639 *** (0.039)
No political discussions		0.415 *** (0.041)	0.414 *** (0.041)	0.416 *** (0.042)	0.413 *** (0.041)	0.417 *** (0.042)	0.417 *** (0.042)
Constant	1.997 *** (0.365)	30.385 *** (5.009)	29.673 *** (4.782)	7.819 *** (2.968)	9.658 *** (3.288)	12.010 *** (3.228)	11.770 *** (4.064)

Note: See notes to table 4. Inflation experience enters this model in its categorical form.



**Table A1 (cont.): Determinants of survey responses, inflation experience in categorical form**

Freedom of speech vs Inflation	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Past experience</i>							
Maximum inflation - 2nd decile	0.599 *** (0.060)	0.661 *** (0.074)	0.660 *** (0.073)	0.535 *** (0.130)	0.514 *** (0.126)	0.560 *** (0.105)	0.556 *** (0.102)
Maximum inflation - 3rd decile	0.676 *** (0.077)	0.832 * (0.080)	0.828 * (0.080)	0.730 * (0.124)	0.737 * (0.126)	0.668 ** (0.112)	0.653 *** (0.106)
Maximum inflation - 4th decile	0.685 ** (0.111)	0.775 ** (0.092)	0.769 ** (0.089)	0.967 (0.116)	0.985 (0.113)	0.819 ** (0.077)	0.809 ** (0.076)
Maximum inflation - 5th decile	0.562 *** (0.073)	0.752 *** (0.073)	0.745 *** (0.073)	0.657 *** (0.102)	0.668 ** (0.106)	0.604 *** (0.072)	0.593 *** (0.067)
Maximum inflation - 6th decile	0.536 *** (0.112)	0.718 * (0.128)	0.712 * (0.128)	0.775 * (0.109)	0.777 * (0.109)	0.792 ** (0.087)	0.779 ** (0.082)
Maximum inflation - 7th decile	0.536 *** (0.090)	0.760 * (0.111)	0.751 ** (0.108)	0.523 *** (0.118)	0.536 *** (0.122)	0.426 *** (0.114)	0.418 *** (0.109)
Maximum inflation - 8th decile	0.462 *** (0.087)	0.716 ** (0.094)	0.706 *** (0.093)	0.585 ** (0.151)	0.597 ** (0.153)	0.395 *** (0.104)	0.383 *** (0.100)
Maximum inflation - 9th decile	0.291 *** (0.073)	0.535 *** (0.118)	0.537 *** (0.120)	0.584 ** (0.148)	0.581 ** (0.150)	0.430 *** (0.071)	0.425 *** (0.066)
Maximum inflation - 10th decile	0.304 *** (0.109)	0.705 ** (0.125)	0.690 ** (0.122)	0.546 * (0.175)	0.539 ** (0.168)	0.384 *** (0.108)	0.383 *** (0.106)
Number of demonstrations		0.983 (0.022)	0.984 (0.022)	1.022 (0.015)	1.025 * (0.015)	1.047 * (0.026)	1.047 * (0.026)
Hyperinflation			0.721 (0.173)	0.678 * (0.157)	0.696 (0.161)	0.663 * (0.157)	0.656 * (0.158)
<i>Current conditions</i>							
Max inflation last 5 years				0.691 (0.507)	0.682 (0.480)	0.411 (0.322)	0.417 (0.330)
Min GDP growth last 5 years				1.409 (4.660)	0.299 (0.975)	0.066 (0.111)	0.087 (0.183)
Max demonstrations last 5 years				0.964 (0.035)	0.953 (0.035)	0.958 (0.041)	0.958 (0.042)
Inflation targeting country					0.707 ** (0.114)		1.050 (0.162)
<i>Demographics</i>							
Female		0.795 *** (0.048)	0.796 *** (0.048)	0.795 *** (0.048)	0.795 *** (0.048)	0.792 *** (0.047)	0.792 *** (0.047)
Chief wage earner		1.132 *** (0.050)	1.131 *** (0.050)	1.125 *** (0.050)	1.128 *** (0.050)	1.114 ** (0.049)	1.112 ** (0.049)
Age 25-34		0.876 (0.084)	0.877 (0.084)	0.835 * (0.079)	0.829 * (0.080)	0.886 (0.086)	0.887 (0.084)
Age 35-44		0.765 ** (0.087)	0.764 ** (0.087)	0.730 *** (0.081)	0.725 *** (0.080)	0.781 ** (0.089)	0.782 ** (0.087)
Age 45-54		0.818 (0.105)	0.818 (0.105)	0.778 ** (0.096)	0.774 ** (0.096)	0.829 (0.116)	0.828 (0.114)
Age 55-64		0.750 ** (0.104)	0.761 ** (0.103)	0.723 ** (0.092)	0.718 ** (0.093)	0.760 ** (0.106)	0.762 ** (0.105)
Age 65+		0.734 ** (0.102)	0.758 ** (0.104)	0.721 ** (0.099)	0.713 ** (0.100)	0.751 * (0.114)	0.756 * (0.114)
Middle education		1.891 *** (0.127)	1.891 *** (0.127)	1.847 *** (0.122)	1.841 *** (0.123)	1.909 *** (0.133)	1.911 *** (0.133)
Upper education		3.261 *** (0.320)	3.257 *** (0.320)	3.309 *** (0.329)	3.302 *** (0.330)	3.459 *** (0.351)	3.464 *** (0.351)
Income		0.977 *** (0.008)	0.979 *** (0.008)	0.976 *** (0.008)	0.976 *** (0.008)	0.970 *** (0.009)	0.970 *** (0.009)
<i>Role of politics</i>							
Political self-positioning -right		0.951 *** (0.014)	0.951 *** (0.014)	0.951 *** (0.014)	0.951 *** (0.014)	0.952 *** (0.015)	0.952 *** (0.014)
Occasional political discussions		0.639 *** (0.037)	0.638 *** (0.038)	0.636 *** (0.037)	0.634 *** (0.037)	0.639 *** (0.038)	0.639 *** (0.038)
No political discussions		0.404 *** (0.045)	0.404 *** (0.046)	0.404 *** (0.044)	0.402 *** (0.044)	0.406 *** (0.045)	0.406 *** (0.045)
Constant	2.473 *** (0.582)	5.500 *** (1.291)	5.381 *** (1.248)	4.331 *** (1.637)	5.324 *** (1.687)	8.798 *** (2.617)	8.567 *** (2.944)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES
Wave fixed effects	YES	YES	YES	YES	YES	NO	NO
Country-wave fixed effects	YES	YES	YES	NO	NO	NO	NO
Number of observations	52395	52395	52395	52395	52395	52395	52395
McFadden's Adj R2	0.058	0.091	0.091	0.089	0.089	0.085	0.086
Cragg-Uhler(Nagelkerke) R2	0.160	0.203	0.203	0.233	0.233	0.225	0.226
AIC	129760.2	92696.87	92689.65	125455.1	125411.3	125954.8	125902.6
BIC	129972.9	92909.67	92902.45	125667.9	125624.1	126167.6	126115.3

Note: See notes to table 4. Inflation experience enters this model in its categorical form.

**Table A2: Determinants of survey responses, EU versus non-EU countries**

	European Union Countries			Non-European Union Countries		
	Order vs Inflation	Say vs Inflation	Free speech vs Infl.	Order vs Inflation	Say vs Inflation	Free speech vs Infl.
<i>Past experience</i>						
Maximum inflation	0.853 *** (0.020)	0.918 *** (0.024)	0.944 ** (0.026)	0.892 *** (0.028)	0.888 *** (0.036)	0.888 ** (0.048)
Number of demonstrations	1.071 *** (0.021)	1.039 ** (0.017)	1.069 *** (0.018)	0.984 (0.017)	0.994 (0.027)	1.008 (0.038)
Hyperinflation	0.700 ** (0.115)	0.502 *** (0.104)	0.624 (0.217)	0.839 *** (0.032)	0.631 *** (0.040)	0.736 * (0.117)
<i>Current conditions</i>						
Max inflation last 5 years	1.947 (2.887)	0.033 * (0.059)	0.002 *** (0.003)	0.588 *** (0.118)	0.635 * (0.167)	1.264 (0.262)
Min GDP growth last 5 years	7.079 (14.200)	0.001 ** (0.002)	0.000 *** (0.001)	19.194 (82.451)	0.086 (0.440)	442.429 ** (1096.223)
Max demonstrations last 5 years	1.073 ** (0.035)	1.029 (0.034)	0.974 (0.059)	1.105 *** (0.030)	1.017 (0.049)	1.074 (0.076)
Inflation targeting country	1.711 *** (0.291)	1.031 (0.185)	0.853 (0.143)	0.162 *** (0.018)	0.826 (0.139)	1.873 *** (0.398)
<i>Demographics</i>						
Female	0.782 *** (0.034)	0.852 ** (0.057)	0.793 *** (0.050)	0.899 (0.090)	0.872 (0.103)	0.800 (0.111)
Chief wage earner	1.107 * (0.059)	1.086 * (0.054)	1.150 *** (0.045)	1.016 (0.086)	0.979 (0.076)	1.084 (0.115)
Age 25-34	1.108 (0.101)	0.967 (0.083)	0.719 *** (0.075)	1.218 (0.219)	1.322 * (0.210)	1.028 (0.241)
Age 35-44	1.146 (0.106)	0.860 (0.079)	0.604 *** (0.076)	1.368 * (0.240)	1.255 (0.187)	0.918 (0.238)
Age 45-54	1.365 *** (0.137)	0.864 (0.090)	0.593 *** (0.089)	1.646 ** (0.346)	1.303 (0.253)	1.178 (0.312)
Age 55-64	1.533 *** (0.150)	0.732 ** (0.099)	0.535 *** (0.078)	2.111 *** (0.251)	1.263 ** (0.125)	1.162 (0.260)
Age 65+	1.995 *** (0.250)	0.685 *** (0.100)	0.558 *** (0.092)	2.518 *** (0.336)	1.157 (0.150)	1.002 (0.289)
Middle education	1.305 *** (0.080)	1.759 *** (0.143)	2.042 *** (0.150)	1.129 (0.092)	1.421 *** (0.125)	1.447 *** (0.152)
Upper education	1.535 *** (0.192)	2.525 *** (0.300)	3.691 *** (0.461)	1.328 *** (0.104)	1.785 *** (0.178)	2.596 *** (0.472)
Income	1.023 ** (0.010)	1.094 *** (0.012)	1.064 *** (0.012)	1.079 *** (0.011)	1.030 *** (0.012)	0.986 (0.021)
<i>Role of politics</i>						
Political self-positioning	1.135 *** (0.018)	0.918 *** (0.016)	0.958 ** (0.019)	1.118 *** (0.023)	0.905 *** (0.027)	0.935 *** (0.012)
Occasional political discussions	1.041 (0.062)	0.684 *** (0.046)	0.676 *** (0.046)	0.946 (0.075)	0.532 *** (0.043)	0.534 *** (0.047)
No political discussions	0.873 (0.081)	0.439 *** (0.059)	0.456 *** (0.060)	0.780 *** (0.075)	0.357 *** (0.033)	0.291 *** (0.051)
Constant	1.828 *** (0.255)	5.689 *** (1.473)	2.650 *** (0.627)	6.889 *** (2.103)	18.774 *** (8.517)	6.867 *** (3.595)
Country fixed effects		YES			YES	
Wave fixed effects		NO			NO	
Country-wave fixed effects		NO			NO	
Number of observations		37065			15330	
McFadden's Adj R2		0.083			0.090	
Cragg-Uhler(Nagelkerke) R2		0.221			0.234	
AIC		90105			35791	
BIC		90241			35844	

Note: See notes to table 4. Sample is split into European Union countries (left panel) and non-European Union countries (right panel).

## European Central Bank Working Paper Series

For a complete list of Working Papers published by the ECB, please visit the ECB's website (<http://www.ecb.europa.eu>).

- I059 "Forecasting the world economy in the short-term" by A. Jakaitiene and S. Déés, June 2009.
- I060 "What explains global exchange rate movements during the financial crisis?" by M. Fratzscher, June 2009.
- I061 "The distribution of households consumption-expenditure budget shares" by M. Barigozzi, L. Alessi, M. Capasso and G. Fagiolo, June 2009.
- I062 "External shocks and international inflation linkages: a global VAR analysis" by A. Galesi and M. J. Lombardi, June 2009.
- I063 "Does private equity investment spur innovation? Evidence from Europe" by A. Popov and P. Roosenboom, June 2009.
- I064 "Does it pay to have the euro? Italy's politics and financial markets under the lira and the euro" by M. Fratzscher and L. Stracca, June 2009.
- I065 "Monetary policy and inflationary shocks under imperfect credibility" by M. Darracq Pariès and S. Moyén, June 2009.
- I066 "Universal banks and corporate control: evidence from the global syndicated loan market" by M. A. Ferreira and P. Matos, July 2009.
- I067 "The dynamic effects of shocks to wages and prices in the United States and the euro area" by R. Duarte and C. R. Marques, July 2009.
- I068 "Asset price misalignments and the role of money and credit" by D. Gerdesmeier, H.-E. Reimers and B. Roffia, July 2009.
- I069 "Housing finance and monetary policy" by A. Calza, T. Monacelli and L. Stracca, July 2009.
- I070 "Monetary policy committees: meetings and outcomes" by J. M. Berk and B. K. Bierut, July 2009.
- I071 "Booms and busts in housing markets: determinants and implications" by L. Agnello and L. Schuknecht, July 2009.
- I072 "How important are common factors in driving non-fuel commodity prices? A dynamic factor analysis" by I. Vansteenkiste, July 2009.
- I073 "Can non-linear real shocks explain the persistence of PPP exchange rate disequilibria?" by T. Peltonen, M. Sager and A. Popescu, July 2009.
- I074 "Wages are flexible, aren't they? Evidence from monthly micro wage data" by P. Lünemann and L. Wintr, July 2009.
- I075 "Bank risk and monetary policy" by Y. Altunbas, L. Gambacorta and D. Marqués-Ibáñez, July 2009.
- I076 "Optimal monetary policy in a New Keynesian model with habits in consumption" by C. Leith, I. Moldovan and R. Rossi, July 2009.
- I077 "The reception of public signals in financial markets – what if central bank communication becomes stale?" by M. Ehrmann and D. Sondermann, August 2009.

- I078 “On the real effects of private equity investment: evidence from new business creation” by A. Popov and P. Roosenboom, August 2009.
- I079 “EMU and European government bond market integration” by P. Abad and H. Chuliá, and M. Gómez-Puig, August 2009.
- I080 “Productivity and job flows: heterogeneity of new hires and continuing jobs in the business cycle” by J. Kilponen and J. Vanhala, August 2009.
- I081 “Liquidity premia in German government bonds” by J. W. Ejsing and J. Sihvonen, August 2009.
- I082 “Disagreement among forecasters in G7 countries” by J. Dovern, U. Fritsche and J. Slacalek, August 2009.
- I083 “Evaluating microfoundations for aggregate price rigidities: evidence from matched firm-level data on product prices and unit labor cost” by M. Carlsson and O. Nordström Skans, August 2009.
- I084 “How are firms’ wages and prices linked: survey evidence in Europe” by M. Druant, S. Fabiani, G. Kezdi, A. Lamo, F. Martins and R. Sabbatini, August 2009.
- I085 “An empirical study on the decoupling movements between corporate bond and CDS spreads” by I. Alexopoulou, M. Andersson and O. M. Georgescu, August 2009.
- I086 “Euro area money demand: empirical evidence on the role of equity and labour markets” by G. J. de Bondt, September 2009.
- I087 “Modelling global trade flows: results from a GVAR model” by M. Bussière, A. Chudik and G. Sestieri, September 2009.
- I088 “Inflation perceptions and expectations in the euro area: the role of news” by C. Badarınza and M. Buchmann, September 2009.
- I089 “The effects of monetary policy on unemployment dynamics under model uncertainty: evidence from the US and the euro area” by C. Altavilla and M. Ciccarelli, September 2009.
- I090 “New Keynesian versus old Keynesian government spending multipliers” by J. F. Cogan, T. Cwik, J. B. Taylor and V. Wieland, September 2009.
- I091 “Money talks” by M. Hoerova, C. Monnet and T. Temzelides, September 2009.
- I092 “Inflation and output volatility under asymmetric incomplete information” by G. Carboni and M. Ellison, September 2009.
- I093 “Determinants of government bond spreads in new EU countries” by I. Alexopoulou, I. Bunda and A. Ferrando, September 2009.
- I094 “Signals from housing and lending booms” by I. Bunda and M. Ca’Zorzi, September 2009.
- I095 “Memories of high inflation” by M. Ehrmann and P. Tzamourani, September 2009.

