Interest rate perceptions and expectations when interest rates are low – survey evidence on Austrian households

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Are Austrians fully aware of the currently prevailing ultra-low interest rate environment? Do they expect these low interest rates to persist for a protracted period? To answer these questions, we conducted a survey on the interest rate perceptions and expectations of Austrian households and present the survey evidence in this study. We find that people are largely aware that interest rates are extremely low and that they expect rates to stay low for some time. But we also find that the knowledge of interest rates is limited, as a high fraction of respondents does not know the levels of various types of interest rates and as people tend to overestimate interest rates both on savings accounts and mortgage loans. Likewise, quite a large fraction of survey participants has not formed any expectations about how high or low interest rates will be in 2020. Whereas awareness of interest rate developments is correlated with socioeconomic factors and the personal relevance of information, these factors appear to only weakly affect perceptions and expectations of the level of interest rates. Our findings suggest that in modeling the monetary policy transmission mechanism, one cannot simply take for granted that people are well-informed about actual interest rates. One needs to take into account perception limitations and biases. People's limited knowledge of interest rates may be seen as yet another argument for central banks to pursue an active communication policy and financial literacy activities.

The current period of ultra-low interest rates in the euro area is reflected in particularly low retail savings and credit interest rates in Austria. The ECB has taken far-reaching measures – including forward guidance and the Expanded Asset Purchase Program (APP) – not only to bring down short-term rates, but also to lower interest rate expectations and hence long-term interest rates. Thus, retail rates are very low also for relatively long tenors, e.g. fixed rate mortgage loans with maturities of 10 to 20 years.

To investigate the extent to which households are fully aware of the current interest rate environment, we surveyed about 2,000 Austrian households between April and May 2015, querying their perceptions of the interest rate level, interest rate expectations and their impressions of how well informed they felt by banks about interest rate changes as well as risks related to interest rate changes.

The issue is relevant for a number of reasons: First, awareness of the current and likely future level of retail rates is a necessary condition for well-informed decisions to either save or spend, including on real estate. Hence, retail rate levels are also an important factor in people's decisions whether to rent or to buy property for housing purposes. If interest rate perceptions and expectations diverged systematically for socioeconomic factors, less informed groups in society would be at a disadvantage in their decision making. Second, if interest rate perceptions di-

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verged systematically from actual interest rates, this could affect the transmission process of monetary policy. More specifically, incomplete awareness of the current ultra-low level of interest rates as well as of the implications of the ECB's APP and forward guidance could reduce the expansionary impact of these measures. In this case, central banks should also consider interest rate perceptions as part of their monitoring and analysis of the transmission of monetary policy measures.

The paper is structured as follows: Section 1 scans the existing literature for relevant findings. Section 2 provides a stylized model of the flow of information for the formation of interest rate perceptions and expectations and examines its relevance for the transmission of monetary policy impulses. Section 3 presents the data raised by the survey. Section 4 summarizes some findings from nonresponses. In section 5, we present the results of respondents' perceptions of nominal interest rates prevailing at the time of the survey, including the ECB's key interest rate, the interest rate on a short-term savings account and the interest rate on a long-term variable rate mortgage. To assess the quality of knowledge, the distribution of responses is compared with the actual ECB key interest rate and the distribution of banks' savings and mortgage lending rates according to the OeNB's official interest rate statistics. Box 1 analyzes respondents' understanding of the definition of the real interest rate. Section 6 summarizes findings on interest rate expectations (again for the ECB's key interest rate, a short-

term savings account, and long-term variable rate mortgage credit). Section 7 analyzes the role of information provided by banks. Section 8 concludes.

1 Limited body of empirical research on knowledge of interest rates

Empirical research on the knowledge of prevailing interest rates is relatively scarce.[2] Household surveys about interest rates are mostly interested in outstanding loans of households or investment products owned by households (e.g. the U.S. Survey of Consumer Finances, SCF,[3] or the Eurosystem's Household Finance and Consumption Survey, HFCS[4]). Therefore, these surveys do not collect data either on respondents' knowledge of the monetary policy rate or on perceptions of interest rates on savings accounts and loans that are newly contracted at the time of the survey. Furthermore, only households that own the underlying product are asked about interest rates. As a consequence, the interest rate information from these surveys is more suitable for evaluating e.g. the economic behavior and decision making of households, the soundness of their financial situation (e.g. the ability to service debt) and resulting risks for the banking sector. This knowledge is especially useful for designing macroprudential measures.

Survey data on interest rate expectations are also limited: The SCF and the Surveys of Consumers of the University of Michigan (Michigan Surveys) ask about the future direction of interest rates (will they go up, stay the same, or go down) over five years and over

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[2] Research in the related field of inflation perceptions and inflation expectations is much more abundant (see Fritzer and Rumler, 2015, for a recent contribution using data from the OeNB barometer survey).

[3] http://www.federalreserve.gov/econresdata/scf/.

[4] https://www.ecb.europa.eu/pub/economic-research/research-networks/html/researcher_hfcn.en.html; for Austria, see http://www.hfcs.at/en.

one year, respectively. The data were used to evaluate consumers' expectations ex post. For example, Chunping and Turvey (2011) compare responses to the SCF question on interest rate expectations with actual rates five years later. They derive three results: First, households tend to have similar interest rate expectations; second, interest rate expectations are biased in the direction of rising interest rates; third, most of the time the majority of households had wrong expectations. Baghestani and Kherfi (2008) use the Michigan Surveys. They find that forecast quality was much better in the volatile interest rate environment from 1978 to 1983 than in the relatively stable interest rate environment between 1984 and 2005. During the latter period, respondents too often predicted an increase in interest rates (a result similar to the findings of Chunping and Turvey, 2011). Baghestani and Kherfi (2008) attribute differences in consumers' forecast ability to different loss functions and different benefits from correctly forecasting future interest rate developments in calm and in volatile interest rate periods (for instance, the benefits of renegotiating loans are potentially higher in volatile periods).

Survey questions on interest rate expectations were also used to investigate whether consumers form expectations that are consistent with economic theory. For example, Dräger et al. (2014) use the Michigan Surveys to investigate whether respondents form expectations about interest rates, inflation and unemployment that are consistent with the Taylor rule; they find that 46% of respondents do so. Responses in line with the Taylor rule are more likely during periods of rising and constant interest rates than during periods of falling interest rates. Furthermore, consistency of expectations with the Taylor rule suffers if inflation is above
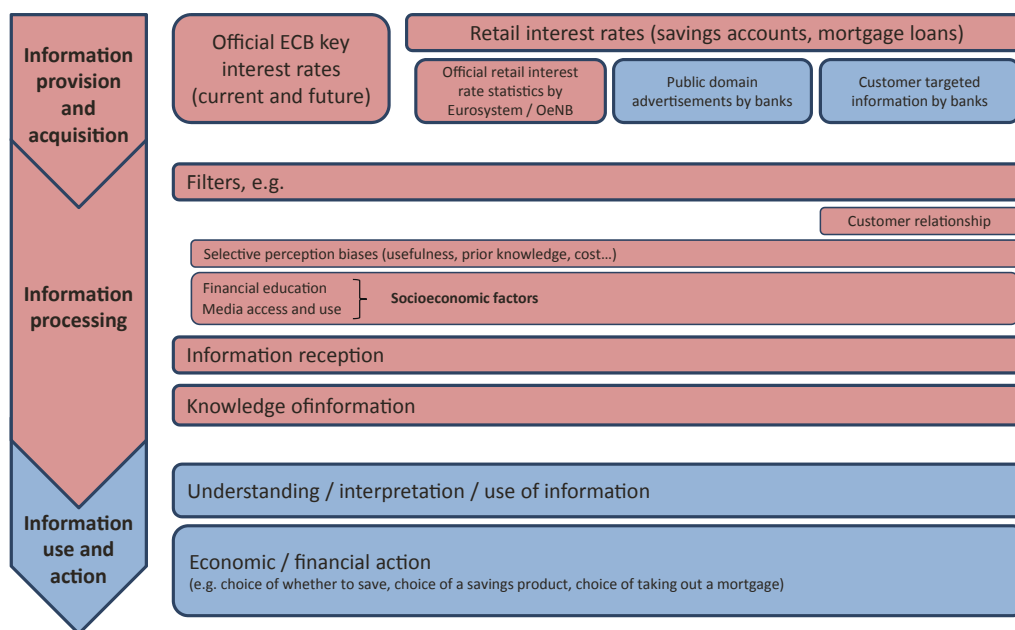
2%. Moreover, increased transparency in the Fed's communication positively affected consistency.

We are not aware of any work mentioning the concept of interest rate perceptions (as opposed to actual interest rates) or raising the issue of how deviations of interest rate perceptions from actual interest rates might affect the transmission of monetary policy impulses.

2 Interest rate perceptions within an information flow and processing model and their relevance for the transmission of monetary policy impulses

How households obtain and process information on interest rates represents important input to our paper. Research directly relevant for our article was published by Lee and Hogarth (1999), who used a special edition of the Michigan Surveys that included additional questions on consumers' knowledge of the terms of their loans. The responses showed that the availability of information on interest rates by no means guaranteed that consumers received and used this information; adoption of publicly available information may take considerable time and will never be complete. Furthermore, awareness of interest rate information does not necessarily imply that consumers actually know and understand this information. Sociodemographic factors such as education, profession and income, but also age and gender imply notable differences in interest rate information reception and knowledge. Information search efforts by consumers are important; existing knowledge and experience facilitate the absorption of new information. For information to be adopted, it should be useful, easy to understand and affordable; both the quality and the quantity of information make a difference (see

Chart 1

Transmission of information on interest rates

Information provision and acquisition	Official ECB key interest rates (current and future)	Retail interest rates (savings accounts, mortgage loans)
		Official retail interest rate statistics by Eurosystem / OeNB
		Public domain advertisements by banks
		Customer targeted information by banks

Information processing
- Filters, e.g.
  - Customer relationship
  - Selective perception biases (usefulness, prior knowledge, cost…)
  - Financial education / Media access and use — Socioeconomic factors
- Information reception
- Knowledge ofinformation

Information use and action
- Understanding / interpretation / use of information
- Economic / financial action (e.g. choice of whether to save, choice of a savings product, choice of taking out a mortgage)

Source: Authors' own design, content inspired by Lee and Hogarth (1999).
Note: Aspects addressed in this paper are shaded in red.

Lee and Hogarth, 1999, and the references quoted there).

Chart 1 is a flow chart with a stylized stepwise description of how information on various interest rates reaches consumers, how consumers process information to form their perceptions of reality, and how they use these perceptions in making decisions. The basic idea is that, in line with communication theory, information on its way from the sender to the receiver may get lost, be filtered and be biased. The red text boxes are aspects our survey and this paper address.

In our flow chart, information on interest rates is provided by the central bank (official interest rates published on the central bank website, by the media, etc.) and by banks. Banks can provide information either to the general public (by internet, advertisements, the media and the like) or, alternatively, target specific existing or prospective customer groups.

This last aspect is interesting, as it might imply a different level of information among consumers depending on their relationship with banks, and thus act as a first set of filters. Information may also be filtered by other mechanisms. First, consumers may be subject to selective perception, i.e. they seek, or become aware of, only the information that is of relevance and use to them, given that knowledge acquisition is costly and higher personal relevance justifies search costs, or they filter information in a way that confirms their preconceived views, thus creating a distorted picture of reality. Furthermore, the level of financial education[5]

[5] In examining inflation expectations, Burke and Manz (2011) show in an experimental setting that more financially literate people are better at predicting inflation. They are better at selecting relevant information as well as making use of the information.

as well as the choice of media may act as information filters. These filters may in turn be influenced by various socioeconomic factors, such as the level of education, the type of profession, age, gender or the location of residence.

Even if information on interest rates reaches the receiver, there is no certainty that it is remembered, understood, correctly interpreted and ultimately used. Other factors may be more important for the decision-making process. For example, unemployment or the fear of unemployment and economic uncertainty more generally may deter households from taking out a loan no matter how low the interest rate may be. Similarly, financially constrained households may have more limited access to credit than higher income and/or higher net wealth households. All these obstacles may imply that an action expected in a world of rationally behaving individuals with perfect information processing and uninhibited access to finance is not taken or is taken in a different way.

Applied to monetary policy, the implication of economic agents' mindset is that savings, investment and credit decisions are not influenced by official rates or even retail rates as such, but by their perceptions, understanding, interpretation of, and ability to act on, these rates. Hence, in the current environment of ultra-low interest rates, if consumers are not fully aware of how low savings and mortgage interest rates actually are, they might not choose to reduce savings in favor of consumption and might not take out mortgages, even though they would be expected to in theory.[6]

Bearing in mind this stylized model of information processing, we will use the following hypotheses to organize the discussion of our empirical findings on households' interest rate perceptions and expectations as well as on the role of information provided by banks:

1. Households have limited knowledge of the prevailing ultra-low level of interest rates; their perceptions of the prevailing level of policy and retail rates are on average biased.
2. Perceptions of the current level of interest rates are heterogeneous. They are influenced by socioeconomic factors such as gender, education, income, profession or age. Furthermore, awareness of interest rates depends on the personal relevance of these rates. Thus, applied to our questionnaire, holding or intending to hold a savings account or a mortgage loan should positively influence knowledge.
3. Respondents find it easier to state expectations about the future development of interest rates in broad terms than to pin them down in concrete numbers. Expectations are heterogeneous. The distribution of expectations is in line with the notion of a zero lower bound of nominal interest rates, i.e. any expected changes tend to be upward.
4. The perceived quality of the information provided by the bank to the customer is correlated with respondents' financial knowledge.

3 The data

We use microsurvey data from the OeNB barometer survey. This survey is conducted regularly by the Institute for Empirical Social Studies, IFES, on behalf of the OeNB. The questionnaire consists of a fixed part (including questions on the socioeconomic characteristics of the respondent and the house-

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[6] *We intend to pursue the latter aspects of households' action in response to the current ultra-low interest rates in future research.*

hold in general) and a variable part that allows questions on specific topics to be added. We added 34 questions on, among other things, respondents' knowledge of the interest rate level, their interest rate expectations, the impact of low interest rates on respondents' savings, investment and borrowing decisions, as well as on how well households feel informed by their banks on interest rate changes as well as risks. The survey was conducted between the end of April and the beginning of June 2015. 2,005 participants older than 15 years were asked in computer-assisted personal interviews (CAPI).

Respondents were asked about their perception of the current monetary policy rate, the interest rate on savings accounts, and the interest rate on mortgage loans. The specific interest rates considered are: first, the interest rate on the ECB's main refinancing operations. For reference, at the time of the survey, the ECB's main refinancing rate stood at 0.05%. Second, respondents were asked about the interest rate on savings accounts with an agreed maturity of between one year and up to two years. Third, the question on loan interest rates focused on a variable rate euro-denominated mortgage of EUR 100,000 with a maturity of 20 years. The questions on interest rates on savings accounts and loans were asked for the fictitious situation of newly allocating money to a savings account or taking out a new loan.

In addition, the survey included questions on expectations of the interest level five years ahead, in 2020. Expectations were queried in two steps: First, participants were asked to indicate which direction they expect for interest rates (considerably higher rates, higher rates, rates at about the same level, or lower rates). In a second step, respondents who did not answer "don't know" or did not refuse to answer the first question were asked for a quantitative assessment. To make it easier for respondents, they were offered a choice of several preset response options in the form of intervals or numbers to approximate the interest rate assessment (e.g. "about 2%"). To merge the answer categories and to facilitate the comparison of the answers on perceptions and expectations, we mapped the original response options into coarser intervals. If the original response options were presented in form of specific numbers, we used the midpoint between the numbers as the endpoints of the interval.

4 General knowledge of interest rates – messages from item nonresponse

We start our presentation of the survey results with an analysis of nonresponses.[7] Quite a large proportion of respondents stated that they were not acquainted with the current level of interest rates and could not form expectations about the future level.[8] This number varies from 15% for the cur-

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[7] *When interpreting "don't know" answers, the following caveat seems appropriate: "Don't know" respondents most likely think that they cannot answer the question. Potential reasons for such an answer are that respondents have absolutely no knowledge of the subject, or have some knowledge and are aware that they do not know the correct answer, or are at least unsure. At the same time, some respondents who think that they can answer a question then give an incorrect answer. Therefore, it is not possible to determine whether respondents who answer "don't know" are less knowledgeable than those who think they know but then give an incorrect answer. Note also that "incorrect" answers do not exist for all questions. In particular, answers to the question on interest expectations cannot be "right" or "wrong." By contrast, answers to the question on the monetary policy rate can be compared to actual prevailing rates and thus can be categorized as factually right or wrong.*

[8] *In this analysis, we regard respondents that refused to answer the question as respondents that do not know the answer or that gave an incorrect answer. The proportion of respondents who refused to give an answer is quite low.*

rent interest rate on savings accounts to 36% for numerical expectations (within preset intervals) for the monetary policy rate (see table 1). Respondents are more willing to answer questions on savings accounts than on mortgage loans or the monetary policy rate, and they are more likely to answer the question on interest rates on mortgage loans than on the monetary policy rate – at least on the current monetary policy rate. This indicates that participants consider themselves better able to respond to questions that concern products that are more widespread and have a higher personal relevance. 76% of respondent households own a savings account but only 23% have an outstanding loan. By contrast, the monetary policy rate is not of direct relevance for households. It may be argued that from a monetary policy perspective, it might not be important for people to have expectations on the monetary policy rate, as this interest rate comes early in the monetary policy transmission mechanism.

Not surprisingly, respondents are more likely to have expectations on the future *direction* of interest rates than on the future interest rate *level*. Furthermore, stating expectations about the future direction of interest rates seems to be easier than stating the current rate. Hence, knowledge of current interest rates is not a prerequisite for forming expectations.

Even though the proportion of respondents who cannot answer differs across questions, regression analysis shows that the factors that are cor-

Table 1

Proportion of respondents who did not answer the questions on interest rates

	Mone-tary policy rate	Savings accounts	Mort-gage loans
	%		
Current rate	35	16	30
Expectations – tendency	22	15	22
Expectations – category	36	25	35

Source: Own calculations based on the OeNB barometer survey.

Note: "Tendency" refers to whether respondents expect interest rates to be (considerably) higher, stay at about the same level or to be lower in 2020. "Category" refers to expected values at preset intervals.

related with a lack of knowledge are similar for all questions. As table 2 shows, there are no clear-cut age effects for most interest rate questions. A higher education level generally reduces the likelihood of not answering. Somewhat surprisingly, this effect is more pronounced for secondary school graduates (and most of the time also for respondents who have completed an apprenticeship) than for university graduates. Women more often stated that they did not know how high the monetary policy rate and the interest rate on mortgage loans was. Gender differences also arise for most other questions (see below), a finding which is in line with other studies on financial literacy (see e.g. Greimel-Fuhrmann et al., 2015).[9] For most questions, respondents who live in a primary residence owned by their household (variable *ownership*) were more likely to give an answer. The same is the case for indi-

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[9] A potential explanation that comes to mind is that male respondents are more likely to be responsible for the household's finances and therefore have more financial knowledge. Indeed, the survey data show that this is the case for 88% of male respondents but only for 54% of female respondents and only 25% of female respondents in households where more than one person has an income. To capture the potential effects of being a target person and not ascribing them spuriously to a gender effect, we include the variable "target person" in the estimations. A respondent is the target person if he or she contributes most to the household income and/or is most knowledgeable about the household finances. It turns out that this variable does not have any significant impact on our results.

Table 2

Don't know (no answer) response to the question on the interest rate level

Average marginal effects after logit estimation

Current level

	Monetary policy rate	Savings accounts	Mortgage loans
Age	−0.06	−0.10 ***	−0.07 **
Age squared	0.01 *	0.01 ***	0.01 **
Education (base category: compulsory schooling or less)			
Apprenticeship	−0.09 **	−0.08 ***	−0.05
Secondary schooling	−0.20 ***	−0.16 ***	−0.12 ***
University	−0.10 *	−0.12 ***	−0.01
Household income (base category: <EUR 1,950)			
EUR 1,950 – EUR 3,300	−0.00	−0.01	0.04
≥EUR 3,300	−0.03	0.03	0.01
Female	0.07 ***	−0.00	0.08 ***
Target person	−0.00	0.00	0.05 *
Ownership	−0.12 ***	−0.03	−0.09 ***
City size (base category: population of up to 5,000)			
5,000 – 50,000	−0.04	0.01	0.04
>50,000	−0.12 ***	−0.05 **	−0.14 ***
Employed	0.00	0.01	−0.04
Loan	0.01	−0.01	−0.16 ***
Intention to take out a loan	−0.04	0.02	−0.05
Savings accounts	−0.01	−0.05 ***	−0.00
Intention to change investment	−0.13 ***	−0.23 ***	−0.12 **
Knowledge of real interest rate	−0.24 ***	−0.13 ***	−0.14 ***

Expectations

	Monetary policy rate		Savings accounts		Mortgage loans	
	tendency	category	tendency	category	tendency	category
Age	−0.01	−0.05	−0.01	−0.07 **	−0.01	−0.07 *
Age squared	0.00	0.01 *	0.00	0.01 ***	0.00	0.01 **
Education (base category: compulsory schooling or less)						
Apprenticeship	−0.07 **	−0.07 *	−0.03	−0.06 *	−0.06 *	−0.07 *
Secondary schooling	−0.10 **	−0.14 ***	−0.06 *	−0.13 ***	−0.09 **	−0.11 ***
University	−0.03	−0.04	−0.01	−0.04	−0.05	−0.03
Household income (base category: <EUR 1,950)						
EUR 1,950 – EUR 3,300	−0.04	−0.05 *	−0.01	−0.02	0.00	0.04
≥EUR 3,300	−0.03	−0.06	−0.03	−0.03	−0.02	0.02
Female	0.03	0.04 *	−0.02	0.01	0.06 **	0.09 ***
Target person	−0.02	−0.02	−0.03	−0.01	0.00	0.02
Ownership	−0.04 *	−0.04	−0.04 **	−0.03	−0.06 ***	−0.09 ***
City size (base category: population of up to 5,000)						
5,000 – 50,000	−0.00	−0.00	0.05 **	0.02	0.02	0.04
>50,000	−0.06 **	−0.08 ***	−0.01	−0.07 ***	−0.03	−0.13 ***
Employed	0.02	0.00	0.02	0.01	−0.03	−0.01
Loan	−0.00	0.02	−0.04 *	−0.03	−0.05 *	−0.09 ***
Intention to take out a loan	−0.02	0.03	−0.03	0.01	−0.09 *	−0.12 **
Savings accounts	−0.03	−0.01	−0.03	−0.03	0.00	0.01
Intention to change investment	−0.11 **	−0.14 ***	−0.12 **	−0.25 ***	−0.16 ***	−0.10 **
Knowledge of real interest rate	−0.16 ***	−0.20 ***	−0.12 ***	−0.15 ***	−0.13 ***	−0.15 ***

Source: Own calculations based on the OeNB barometer survey.

*Note: ***, **, * indicate significance at the 0.10, 0.05 and 0.01 level. To improve readability, we divided the age variable by 10 and consequently age squared by 100.*

viduals that live in large cities (variable *city size*). Furthermore, the personal relevance of interest rates and interest rate changes seems to play a role: Households that want to change their investment (variable *intention to change investment*[10]) were more likely to give an answer. It is less likely that a respondent with an outstanding mortgage loan (variable *loan*) does not know how high the current rate is or has no expectations. The likelihood of giving an answer increases if households intend to take out a loan in the next 12 months (variable *intention to take out a loan*). In the case of savings accounts, respondents who own this product (variable *savings accounts*) are also more likely to feel informed. Whether the respondent holds a job (variable *employed*[11]) does not affect the likelihood of answering questions. The strong correlation with knowledge of the definition of the real interest rate remains even when controlling for other factors, which confirms the notion that knowledge of this definition may be regarded a proxy of financial literacy.

5 Perceptions of the current level of interest rates

Let us now turn to the respondents who answered our survey questions. Our survey data suggest that respondents are generally aware that we are currently expe-riencing a period of ultra-low interest rates, while at the same time they tend to overestimate the interest rate level.

5.1 Perceptions of the monetary policy rate

The upper left panel of chart 2 suggests that the majority of respondents are aware that monetary policy rates are currently ultra-low. More than 40% of respondents who gave a current answer correctly stated the level of the actual monetary policy rate in effect (0.05%).[12] Only a small proportion of respondents (12%) think that the monetary policy rate is zero or negative.[13] One-quarter slightly overestimated the monetary policy rate (more than 0.05% but less than 0.75%) and about 20% of respondents strongly overestimated the monetary policy rate, assuming that it was higher than 0.75%.

The results in table 3 suggest that knowledge of the level of the monetary policy rate is explained by roughly the same factors as knowledge of the definition of the real interest rate.[14] A higher degree of formal education, ownership of the principal residence and the intention to change investment increases the likelihood of a correct answer. Women are less likely to give a correct answer, however. Knowledge of the definition of the real interest rate

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[10] The variable "intention to change investment" takes the value 1 if respondents answer the question in the affirmative: "Does your household intend to prefer different savings or investment instruments in the next 12 months because of the low interest rate environment?"

[11] Including full and part-time jobs as well as apprenticeships.

[12] Taking into account "don't know" answers, refusals to answer and incorrect answers, 28% of respondents are familiar with the current monetary policy rate.

[13] As the proportion of respondents who think that the monetary policy rate is negative is small, confusion with the interest rate on the deposit facility (which at the time of the survey stood at −0.20%) does not appear to be an important issue.

[14] Note that respondents who gave a wrong answer are a subset of respondents who refused to give an answer, as we assigned both to the category "incorrect answer." A robustness test in which we took into account only respondents who answered the question on the level of the monetary policy rate suggests that results do not change in any significant way.

Box 1

Knowledge of the real interest rate

We asked respondents whether they knew the definition of real interest rates. We did so for two reasons: First, in economic theory, the real rather than the nominal interest rates should guide savings and investment decisions. Second, we take knowledge of this fundamental concept as a simple and crude proxy of financial literacy. Respondents could choose from a list of three potential answers. About 17% of respondents chose the first answer "Real interest rates correspond to the nominal interest rate minus the effective interest rate." 10% opted for the second answer "Real interest rates correspond to the nominal interest rates minus fees." Only 30% chose the correct answer: "Real interest rates correspond to the nominal interest rates minus inflation." More than 40% of survey participants stated that they did not know the answer (on this topic see also Greimel-Fuhrmann et al., 2015).

Regression results shown in the table on the right suggest that people with a higher degree of formal education were more likely to state the proper definition. Furthermore, ownership of financial products (loans, savings accounts) as well as ownership of the principal residence is positively correlated with knowledge of the concept of real interest rates. Female respondents were less likely to give the right answer to the question. The finding that respondents intending to take out a loan scored worse in terms of knowing the definition of the real interest rate is puzzling; it might suggest that knowledge of the concept (and therefore also of the level) of the real interest rate may not be decisive for households' loan decisions.

Correct answer to the question on the real interest rate

Average marginal effects after logit estimation

Age	0.06
Age squared	−0.01 *
Education (base category: compulsory schooling or less)	
Apprenticeship	0.07 **
Secondary schooling	0.14 ***
University	0.20 ***
Household income (base category: <EUR 1,950)	
EUR 1,950 – EUR 3,300	0.01
≥EUR 3,300	0.04
Female	−0.06 **
Target person	0.05
Ownership	0.05 **
City size (base category: population of up to 5,000)	
5,000 – 50,000	0.02
>50,000	0.03
Employed	−0.01
Loan	0.06 **
Intention to take out a loan	−0.10 *
Savings accounts	0.11 ***
Intention to change investment	−0.00

Source: Own calculations based on the OeNB barometer survey.

*Note: ***, **, * indicate significance at the 0.10, 0.05 and 0.01 level. To improve readability, we divided the age variable by 10 and consequently age squared by 100.*

is strongly correlated with knowledge of the level of the monetary policy rate.[15] It may seem surprising that households with an outstanding loan are less likely to give a correct answer. These households display some tendency to overestimate the monetary policy rate. A possible explanation may be that they still have in mind the higher past monetary policy rate in effect when they took out the loan.
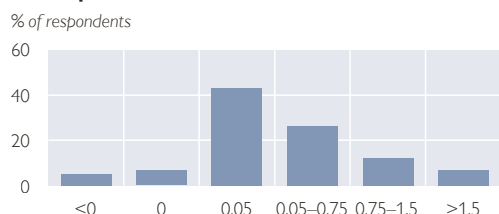
It is not apparent which factors affect the assessment of the monetary policy rate, i.e. which factors determine whether respondents who gave an incorrect answer over- or underesti-

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[15] One might argue that the question on the definition of the real interest rate should not enter into the econometric analysis because both knowledge of the monetary policy rate and knowledge of the correct definition of the real interest rate are knowledge questions and are likely to be driven by the same factors. However, excluding the variable indicating knowledge of the real interest rate definition from the explanatory variables affects results only marginally.
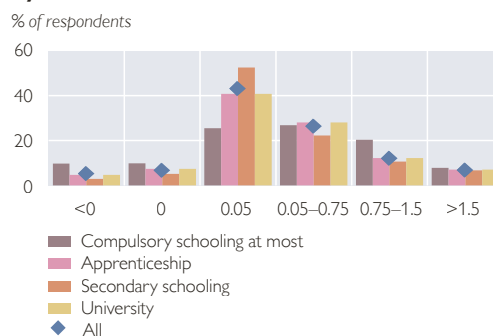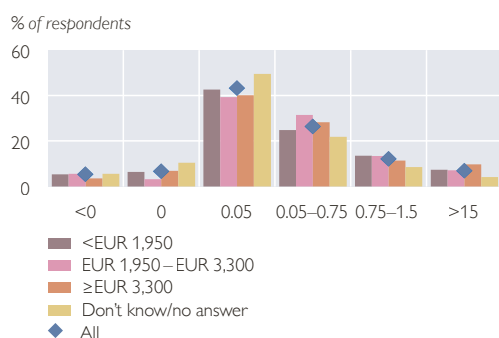
Chart 2

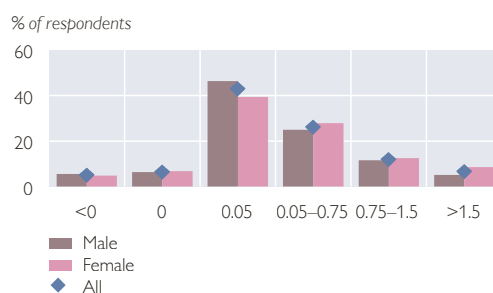## Perceptions of the monetary policy rate

All respondents

% of respondents

By education
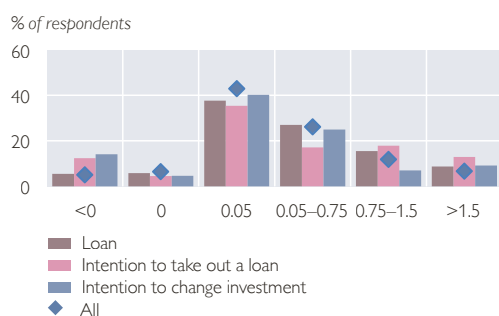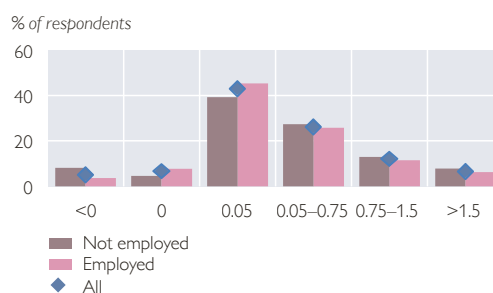
% of respondents

Compulsory schooling at most
Apprenticeship
Secondary schooling
University
All

By household income

% of respondents

<EUR 1,950
EUR 1,950 – EUR 3,300
≥EUR 3,300
Don't know/no answer
All

By gender

% of respondents

Male
Female
All

By loans/investment

% of respondents

Loan
Intention to take out a loan
Intention to change investment
All

By employment

% of respondents

Not employed
Employed
All

Source: Own calculations based on the OeNB barometer survey.

Note: Excluding respondents who gave no answer.

mated the actual rate and to what extent.[16] Chart 2 gives an overview of the assessment of monetary policy rates by several socioeconomic characteristics. Regarding potential reactions of households to the ultra-low interest rate environment, note that the lower left-hand panel in chart 2 suggests that respondents from households that intend to change their investment or to take out a loan are most inclined to think that the official rate is negative.

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[16] *We experimented with ordered probit regressions as well as with interval regressions, but were not able to detect any significant patterns. The same is the case for interest rates on savings accounts and on mortgage loans (see below).*

Table 3

Correct answer to the question on the monetary policy rate

Average marginal effects after logit estimation

Age	−0.04
Age squared	0.00
Education (base category: compulsory schooling or less)	
Apprenticeship	0.12 ***
Secondary schooling	0.26 ***
University	0.25 ***
Household income (base category: <EUR 1,950)	
EUR 1,950 – EUR 3,300	−0.02
≥EUR 3,300	−0.04
Female	−0.07 ***
Target person	−0.04
Ownership	0.11 ***
City size (base category: population of up to 5,000)	
5,000 – 50,000	0.03
>50,000	−0.02
Employed	0.02
Loan	−0.09 ***
Intention to take out a loan	−0.06
Savings accounts	−0.03
Intention to change investment	0.03
Knowledge of real interest rate	0.21 ***

Source: Own calculations based on the OeNB barometer survey.

*Note: ***, **, * indicate significance at the 0.10, 0.05 and 0.01 level. To improve readability, we divided the age variable by 10 and consequently age squared by 100.*

5.2 Interest rate perceptions on savings accounts

Most respondents are aware that interest rates on savings accounts are currently quite low (see table 4). 54% of respondents expect to receive less than 0.9% interest on a new savings account and only 8% of respondents expect interest rates above 1.75%.

At the same time, respondents considerably overestimate interest rates on savings accounts. While there is an official policy rate, there is no official rate for savings accounts, but we can compare our survey data with the data from the OeNB statistics on the interest rate of credit institutions, i.e. information by banks on actually contracted interest rates on savings accounts. According to the interest rate statistics, the volume-weighted average interest rate on savings amounted to 0.38% in May 2015.[17] Hence, three-quarters of respondents choose interest rate intervals that are clearly above the average rate according to the interest rate statistics. Microdata from the interest rate statistics allows us to map volumes from the interest rate statistics at the same interest rate intervals that we use for survey data. Table 4 (lower part) shows the fraction of each interest rate category in the total volume of new savings accounts. The comparison between the official interest rate statistics and our household survey suggests that households have a tendency to overestimate interest rates on savings accounts. Whereas 83% of all savings that were deposited in a savings account in May 2015 receive less than 0.5% interest, only 25% of respondents believe that interest rates on savings accounts fall in this category. Moreover, whereas 47% of respondents think that they would receive over 0.9% interest on new savings deposits, banks granted such an interest rate for only 5% of all newly made deposits.[18]

Chart 3 shows survey results on the assessment of the interest rate on savings accounts by respondents' socioeconomic characteristics and compares

[17] The interest rate statistics are available at http://www.oenb.at/en/Statistics/Standardized-Tables/interest-rates-and-exchange-rates/Interest-Rates-of-Credit-Institutions.html. The survey question corresponds to interest rates on new business of euro saving deposits of households with an agreed maturity of over one year and up to two years.

[18] A comparison of survey data and data from the statistics on the interest rate of credit institutions has some limitations because the two data sources are quite different. At the aggregate level, however, the estimates in the survey and the data from the interest rate statistics should be similar as long as there are no reasons to believe that survey respondents would obtain different conditions for savings accounts than savers who actually make new deposits.

Table 4

Perception of interest rates on savings accounts

	Interest rate in %					
	<0.5	0.5–0.9	0.9–1.75	1.75–3	>3	Don't know/ no answer
Survey						
	% of respondents excluding those who gave no answer					
All respondents	25	29	39	7	1	16
Interest rate statistics						
	% of each interest rate category in the total volume of new savings accounts					
Deposits	83	12	5	0	0	
Savings deposits	88	11	1	0	0	

Source: Own calculations based on the OeNB barometer survey, OeNB interest rate statistics.

Note: Savings deposits refer to deposits on savings accounts, deposits also include electronic saving products.

them to the data from the interest rate statistics. The chart suggests that interest rate perceptions differ only marginally among socioeconomic groups. It seems that people with tertiary education and respondents from households that intend to change their savings and investment behavior chose the correct category "below 0.5%" more frequently than the average.[19] Respondents who intend to change their investment behavior might assess the interest rate level as lower for two reasons: First, they are more involved and therefore better informed. Second, households might want to use different savings and investment products because they have

a low assessment of the interest rate level.

5.3 Interest rate perceptions on mortgage loans

Households' perceptions of interest rates on mortgage loans (table 5) show a pattern similar to their perceptions of the monetary policy rate and of the interest rate on savings accounts. Respondents are largely aware that interest rates are very low, but again display a clear tendency to overestimate interest rates. Possible explanations could be that there is some time lag in the transmission from policy to retail rates in general, which might be even larger

Table 5

Perception of interest rates on mortgage loans

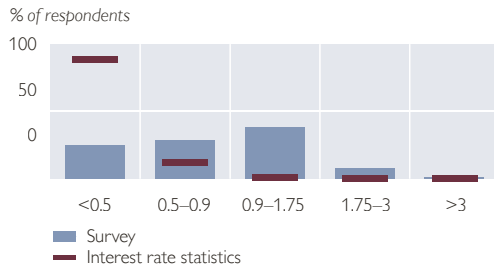|	*Interest rate in %*					
	<1	1–1.75	1.75–2.75	2.75–4.5	>4.5	Don't know/ no answer
Survey						
	% of respondents					
All respondents	4	20	26	32	18	30
Interest rate statistics						
	% of each interest category in the total volume of new mortgage loans					
Mortgage loans	0	33	55	11	0	

Source: Own calculations based on the OeNB barometer survey, OeNB interest rate statistics.

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[19] *The survey data also suggest that respondents with tertiary education are more inclined to change their investment behavior than respondents with a lower level of formal education.*
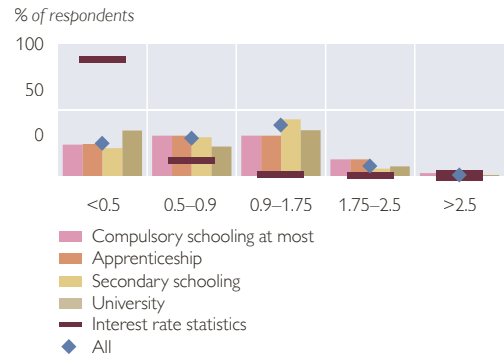
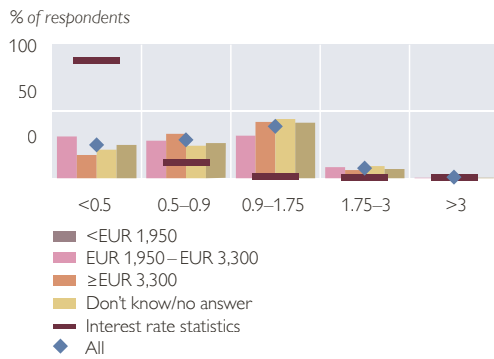Chart 3

Perceptions of interest rates on savings accounts

All respondents

% of respondents

Survey
Interest rate statistics

By education

% of respondents

Compulsory schooling at most
Apprenticeship
Secondary schooling
University
Interest rate statistics
All

By household income

% of respondents

<EUR 1,950
EUR 1,950 – EUR 3,300
≥EUR 3,300
Don't know/no answer
Interest rate statistics
All

By gender

% of respondents

Male
Female
Interest rate statistics
All

By loans/investment

% of respondents

Loan
Intention to take out a loan
Intention to change investment
Interest rate statistics
All

By employment

% of respondents

Not employed
Employed
Interest rate statistics
All

Source: Own calculations based on the OeNB barometer survey and OeNB interest rate statistics.

Note: Excluding respondents who gave no answer. Interest rate statistics in % of interest rate category in the total volume of new savings accounts.

when interest rates decline. Furthermore, banks may try to increase markups over the reference interest rate for new credits in times of falling interest rates to compensate for falling interest rate margins in a phase of ultra-low interest rates with a legal or de facto zero lower bound on deposit rates. Expert groups on consumer protection have documented such behavior (Arbeiterkammer, 2012). The possibility of an inverse relationship between the size of markups and the level of the reference rate is also in line with the development of mortgage lending rates according to the OeNB interest rate statistics over recent years; however, a more thorough analysis would be necessary to deter-

mine the underlying drivers. Households may anticipate or overestimate this lag. Another explanation would be that fees are increased to compensate for reduced net interest rate margins in a period of ultra-low interest rates. As pure interest rates and fees are not always so easy to disentangle, households might have the impression that interest rates are declining more slowly than they actually are.

According to the OeNB interest rate statistics, the volume-weighted average interest rate on mortgage loans was 2.03% in May 2015.[20] Our survey data show that 50% of respondents thought that interest rates on mortgage loans are above 2.75%, which is clearly above the average rate of the interest rate statistics. According to the interest rate statistics, rates above 2.75% were charged for only 11% of the new loan volume.[21] In fact, 18% of respondents even thought that they would pay interest rates of more than 4.5%, but such high interest rates were not charged on any new variable rate mortgage loans at all at the time of the survey.

Chart 4 shows survey responses by socioeconomic characteristics and again compares them to data from the OeNB interest rate statistics. As is the case with the other interest rates, mortgage interest rate perceptions also differ only marginally among respondents with different socioeconomic characteristics. We observe some tendency of households that intend to take out a loan or to change their investment to expect mortgage interest rates of below

1%. For these households, their low perception of interest rates might be one good reason to take out a loan. Our microdata do not allow us to investigate why these households have a lower-than-average interest rate perception (e.g. a better bargaining position, better creditworthiness). Surprisingly, among households that intend to take out a loan, quite a large proportion thinks that interest rates are above 4.5%. The broad dispersion of responses by households intending to take out a loan may indicate that these households have not yet thoroughly informed themselves about current mortgage rates or that the low interest rates are not the motivation for taking out a loan.[22] Finally, it is striking that around two-fifths of households with an outstanding loan thought that prevailing mortgage interest rates on new loans were between 2.75% and 4.5%. This may reflect perception biases (memory of the higher initial rate at which the loan was taken out).

6 Interest rate expectations

In this section, we analyze respondents' expectations for the interest rate level five years ahead, i.e. in 2020. Information on interest rate expectations of consumers is important for several reasons: Among other things, savings, investment, and consumption decisions hinge on interest rate expectations — at least in theory, where consumers are rationally acting agents. Low interest rate expectations for a protracted period could point to low expectations for

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[20] *The survey question corresponds to new euro-denominated loans for house purchases to households with an initial rate fixation of up to one year in the interest rate statistics.*
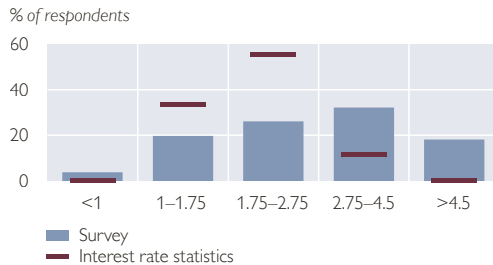
[21] *The caveat stated in the section on interest rates on savings accounts regarding the comparability of survey data and data from the interest rate statistics is even more applicable to interest rates on mortgage loans. The assessment of interest rates by individual borrowers also depends on their creditworthiness, which we cannot determine with the available data.*

[22] *About 30% of respondents stated that the low interest rate environment is not among the reasons why they intend to take out a loan.*
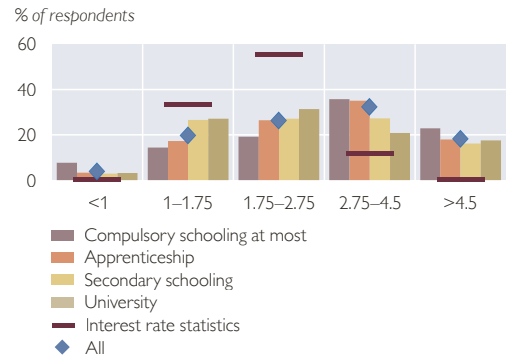
Chart 4
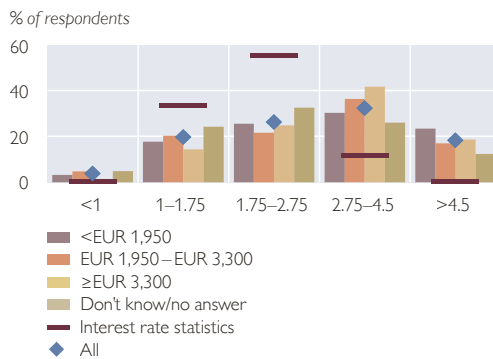
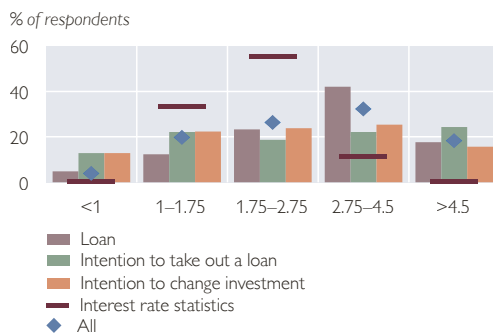## Perceptions of interest rates on mortgage loans

All respondents

% of respondents

- Survey
- Interest rate statistics

By education

% of respondents

- Compulsory schooling at most
- Apprenticeship
- Secondary schooling
- University
- Interest rate statistics
- All

By household income

% of respondents

- <EUR 1,950
- EUR 1,950 – EUR 3,300
- ≥EUR 3,300
- Don't know/no answer
- Interest rate statistics
- All

By gender

% of respondents

- Male
- Female
- Interest rate statistics
- All

By loans/investment

% of respondents

- Loan
- Intention to take out a loan
- Intention to change investment
- Interest rate statistics
- All

By employment

% of respondents

- Not employed
- Employed
- Interest rate statistics
- All

Source: Own calculations based on the OeNB barometer survey.

Note: Excluding respondents who gave no answer. Interest rate statistics in % of interest rate category in the total volume of new mortgage loans.

inflation and/or economic growth (secular stagnation). Furthermore, from a financial stability perspective, households that expect unrealistically low interest rates might be more inclined to take out a loan and might have overly optimistic expectations about their ability to pay it back.

We asked about rate expectations in two formats, first in terms of the expected direction of changes and then in terms of ranges. Table 6 suggests that the majority of respondents expect interest rates to stay at about the same level or rise somewhat by the year 2020. There are some differences across expected rates. Only few re-

spondents expect lower monetary policy rates or lower interest rates on mortgage loans, while one-fifth of respondents who gave an answer expect interest rates on savings accounts to be even lower in five years. By contrast, almost two-thirds expect somewhat or considerably higher mortgage rates.

Turning to interest rate expectations in terms of ranges, chart 5 suggests that about 20% of respondents expect the monetary policy rate to remain at 0.05% in 2020, 40% expect it to be in the range of 0.05% to 0.75%, and about one-third of respondents expect the monetary policy rate to be above 0.75% in 2020. Fewer than 10% expect it to be at zero or even below. A vast majority of respondents expects nominal interest rates on savings accounts to be below 1.75%. As this is below the Eurosystem's definition of price stability, it is likely that such nominal interest rates correspond to negative rates in real terms. Only 15% expect nominal pretax interest rates on savings accounts to be around the price stability definition (implying a zero real interest rate); virtually nobody expects positive real interest returns. Thus, overall, respondents expect a protracted period of ultra-low interest rates. The expectations of households are compat-

ible with market expectations. For example, one-year forward five-years ahead interest rate expectations derived from EONIA swaps pointed to market expectations of about 0.8% in May 2015 (the time of the survey).

Our survey data also show that a certain fraction of respondents expects relative interest rate movements that are disadvantageous for households. Among respondents who expect monetary policy rates to stay at about the same level, 46% expect mortgage rates to increase. Furthermore, over 50% of the (small) number of households that expect lower monetary policy rates expect higher mortgage rates. Reasons for this asymmetry could be skepticism toward banks in general or the fear that the ongoing strengthening of regulatory rules might make loans more expensive. The notion that banks might counter a possible overheating in real estate prices by demanding higher risk premiums on housing loans would seem to be too sophisticated to be taken into account by the general public. Among households that expect higher mortgage rates, 32% expect interest rates on savings accounts to stay about the same and 22% even expect lower interest rate on savings accounts. Three-quarters of respondents who expect lower interest rates on savings accounts expect higher interest rates on mortgages.

It is also interesting to compare households' interest rate expectations with their perceptions of current levels (i.e. the red bars versus the blue bars in chart 5). What emerges clearly is that respondents on the whole expect all three interest rates covered in our survey to be above current levels in 2020. Thus, on average they do not take the current interest rate level as the best predictor of future rates; on the contrary, they seem to believe that the current level of interest rates is extraordi-

Table 6

Interest rate expectations for the year 2020

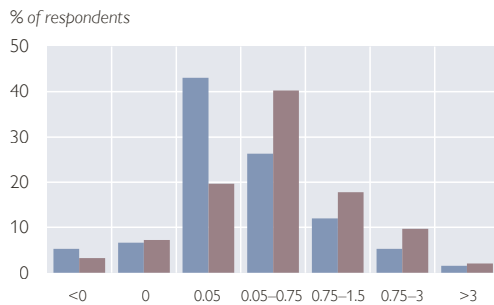|	Monetary policy rate	Savings accounts	Mortgage loans
	% of respondents		
Considerably higher	10	4	14
Somewhat higher	43	31	51
About the same level	41	45	30
Lower	7	20	4
Don't know/no answer	22	15	22

Source: Own calculations based on the OeNB barometer survey.
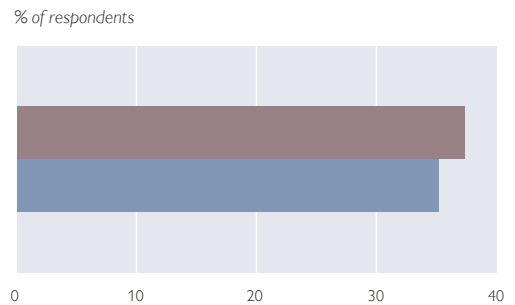*Note: Upper panel excludes respondents who gave no answer.*
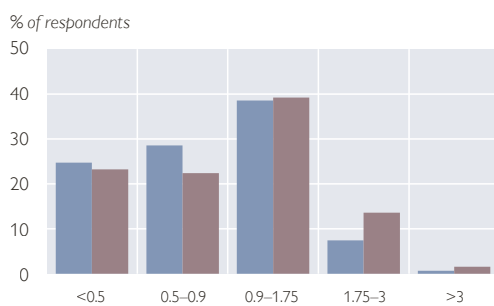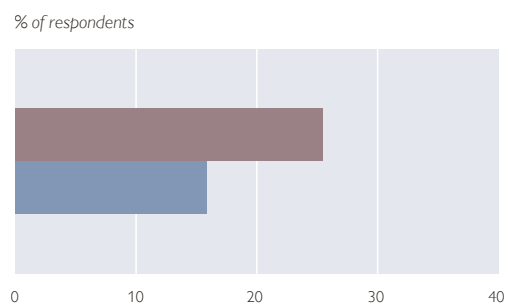
Chart 5

Current rates versus expectations
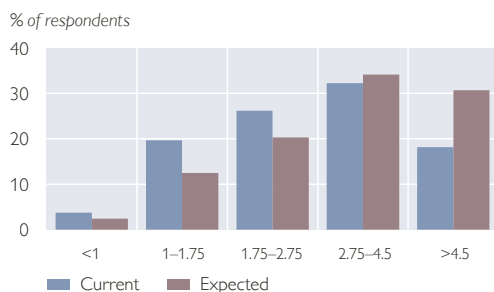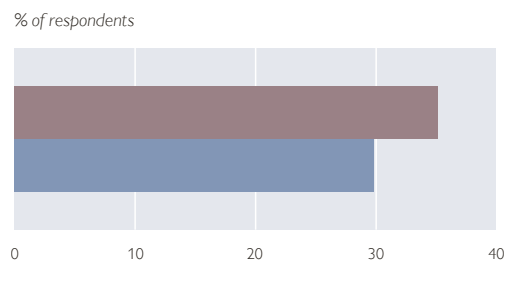
Source: Own calculations based on OeNB barometer survey.

Note: Left panels exclude respondents who gave no answer.

narily low and that the odds for the future are for rates to "normalize" toward higher levels more in line with respondents' previous experience.

Finally, let us take a closer look at interest rate expectations of households that have taken out a loan or that intend to take out a loan. This is important from a financial stability point of view, as excessively low rate expectations could mean that households underestimate the future interest rate burden and potentially their ability to service a

debt. Chart 6 suggests that a disproportionately high share of respondents who live in a household that intends to take out a loan expects mortgage interest rates to be lower in five years. In any event, mortgage rate expectations and loan intentions seem to be consistent.

7 Information by banks

As indicated at the outset in chart 1, banks should be expected to play a major role in the dissemination of information on retail interest rates – after
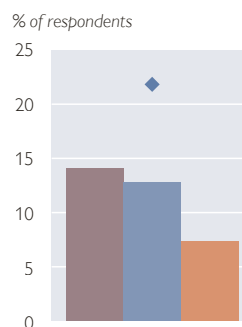
Chart 6

Expectations and mortgages

Interest rate expectation on mortgage loans

% of respondents

Don't know/no answer

% of respondents

Loan
Intention to take out the loan
Intention to change investment
◆ All
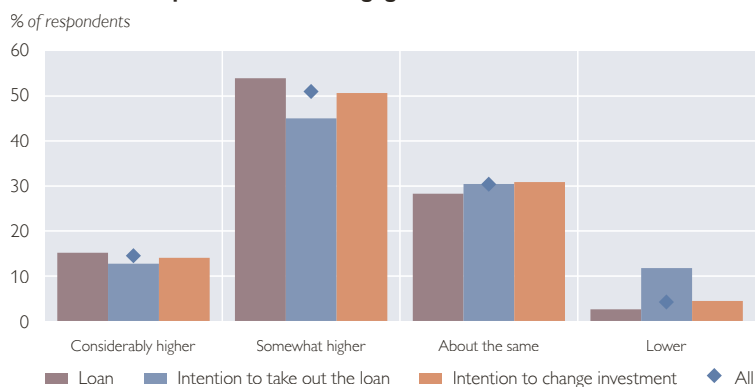
Source: Own calculations based on the OeNB barometer survey.

all, interest rates are the key price component of their savings and credit products. Moreover, transparency on retail interest rates including changes over the contract period in the case of variable rate contracts are a vital element of price transparency that consumers need in order to optimize their savings and borrowing decisions as well as to monitor risks and opportunities associated with their financial contracts.

We therefore asked survey participants whether they felt well-informed about interest rate changes on savings accounts and loans and how often their bank informed them. Borrowers were additionally asked whether they were satisfied with the information they receive from their bank on risks stemming from higher interest rate expenditure.

About half of the owners of a savings account are satisfied with the information banks provide on interest rate changes on savings accounts. Most owners state that they are informed about interest rates only when interest rates change (42%), 21% state that they are regularly informed and 31% that they have never been informed (see table 7). Not surprisingly, survey data re-

veal that the satisfaction with the information on interest rate changes is correlated with the frequency of information. More than 90% of respondents who state they are regularly informed are satisfied with the information policy of banks; this is still the case for 60% of savings account owners who are informed when interest rates change, but only for 5% of savers who state that they are never informed. Hence, the survey data suggest that savers would appreciate more regular information on interest rates on their savings accounts.

Two-thirds of borrowers are satisfied with the information they receive on interest rate changes from their banks. The majority of borrowers state that they are only informed about interest rates when the latter change. One-third is informed on a regular basis and 7% state that they have never been informed. However, the Austrian Banking Act stipulates that borrowers have to be informed in advance of changes in the interest rate. The survey cannot determine whether borrowers are actually not informed or whether they just think that they are not.

Table 7

Information on interest rates

% of respondents

	Satisfied with bank information on interest rate changes	
	Savings accounts	Loans
Don't know/no answer	5	6
Yes	46	65
No	49	29
Does not own product	24	78

	How often informed about interest rates	
	Savings accounts	Loans
Don't know/no answer	6	5
Regularly	21	33
Only when interest rate changes	42	54
Never	31	7

	Well-informed by bank about risks related to interest rate changes
	Loans
Don't know/no answer	8
Yes	58
No	34

Source: Own calculations based on the OeNB barometer survey.

As with savings accounts, consumer satisfaction and the frequency of information on the interest rate are highly correlated. More than 96% of borrowers that receive regular information are satisfied. This proportion drops to 60% if information is only provided in the event of interest rate changes and to only 10% for respondents who state that they never receive information on the interest rate. As with savings accounts, there seems to be room for improvement on the way banks provide information on interest rates. It seems that borrowers would appreciate more regular information. If borrowers were to neglect information on interest rates that is in principle provided, banks could think about making the information more accessible and visible.

Finally, we asked borrowers whether they felt well-informed about risks related to interest rate changes (e.g. higher annuities). Such risks are important in Austria because a very large proportion of loans is at variable rates.[23] The importance of information on interest rate risks is demonstrated by results from the U.S. and the U.K. Bucks and Pence (2006) report that in the U.S.A., borrowers with an adjustable rate mortgage are not aware how much the interest rate on their mortgage can change. For the U.K., Miles (2004) suggests that households attach too much weight to the initial level of

[23] *Variable rate loans accounted for 78% of new lending (in euro) to households in Austria (euro area: 25%) in the third quarter of 2015.*

Table 8

Financial literacy and satisfaction with bank information

% of respondents satisfied with bank information

	Definition real interest rate			Monetary policy rate		
	Correct	Incorrect	Difference	Correct	Incorrect	Difference
Satisfied with interest rate information on savings accounts	53	47	7 **	47	50	–3
Satisfied with interest rate information on loans	76	65	11 **	76	67	10 *
Satisfied with information provided on interest rate risk	69	60	9 *	67	62	5

Source: Own calculations based on the OeNB barometer survey.

*Note: ***, **, * indicates whether the difference between the proportions is statistically different from zero at the 0.10, 0.05 and 0.01 level of significance using a Wald test. Correct (incorrect) indicates whether respondents gave a correct (incorrect) answer to the question on the definition of the real interest rate or the question on the level of the monetary policy rate.*

monthly repayments and do not pay enough attention to the future movements of the interest rate and their impact on loan affordability. According to our survey, 58% of respondents feel well-informed about interest rate risks. This fraction is higher for respondents who are satisfied with bank information on interest rate changes (83%). Conversely, only 10% of households that are not satisfied with the information they receive on interest rate changes appreciate the information on interest rate risks.

To conclude this section, let us come back to our fourth hypothesis about the correlation between the perceived quality of information provided by the bank and respondents' knowledge. We find that this hypothesis is partly confirmed. Respondents with higher financial literacy (as proxied with knowledge of the definition of the real interest rate and of the level of the monetary policy rate) are in general more satisfied with banks' information on interest rate changes and associated risks. The effect of financial literacy on satisfaction with bank information is most pronounced with respect to information on interest rate changes for loans (see table 8). However, the ob-

served differences in satisfaction with bank information with respect to respondents' knowledge of the definition of the real interest rate or of the level of the monetary policy rate between well-informed respondents and respondents that lack this knowledge are sometimes relatively small and, with regard to the knowledge of the monetary policy rate, not always statistically significant.

Note, however, that the survey data leave causality open: We cannot discern whether households are more knowledgeable because they receive better information from their bank or whether more knowledgeable households get better information, ask for better information, or are better at processing information.

8 Summary and conclusions

In this paper we analyzed financial behavior of Austrian households in the current low interest rate environment. Our article builds on financial literacy and behavioral finance literature. The findings are also relevant for the efficacy of the transmission mechanism of monetary policy, since it may be argued that in the end, perceived (rather than actual) current and expected future re-

tail interest rates drive consumers' savings and borrowing behavior. Applied to our initial hypotheses, our findings suggest the following:

Our findings confirm our first hypothesis that households have limited knowledge of interest rates. This is suggested by the high proportion of "don't know" answers to the questions on the current and expected levels of interest rates and the nonnegligible proportion of respondents who gave wrong answers on the question regarding the current level of the policy rate. The hypothesis that perceptions of interest rates are heterogeneous and on average biased holds true: Perceptions of both savings and mortgage rates exhibit a noticeable upward bias. This notwithstanding, the vast majority of respondents is at least aware that we are currently experiencing a period of very low interest rates.

The second hypothesis that perceptions of the current level of interest rates are influenced by socioeconomic factors and personal relevance was partly confirmed insofar as knowledge (i.e. not answering "don't know" and giving a correct answer to the question on the current policy rate) is affected by socioeconomic factors. By contrast, perceptions of the level of interest rates seem to be only weakly affected by socioeconomic factors. Our data do not seem to suggest that personal relevance for investment or credit decisions leads to more accurate perceptions of prevailing current interest rates.

Our results confirm the third hypothesis in that respondents find it easier to state the direction of future interest rate developments than to indicate a specific value. Respondents ex-

pect interest rates to stay very low in the near future. While expectations are indeed quite heterogeneous, they are at the same time very much in line with the notion of a zero lower bound of interest rates, i.e. hardly any household expects negative nominal interest rates.[24]

Our fourth hypothesis on the correlation between financial literacy and satisfaction with bank information is partly confirmed. The effect of financial literacy on satisfaction with bank information is most pronounced for mortgage loans.

On the whole, it seems that while respondents display some important knowledge and awareness gaps about actual current interest rates and have difficulties forming expectations about the values of future interest rates, their perceptions of current interest rates as well as their expectations of future interest rates are broadly consistent with the ECB's current expansionary monetary policy stance and its signals that interest rates are going to stay very low over the medium term. At the same time, a noticeable upward bias in households' perceptions of prevailing savings accounts and mortgage credit interest rates might indicate that Austrian households are not, or not yet, aware of the full extent of the low interest rate environment.

This perception bias might imply that households' financial behavior does not yet reflect the full expansionary effect of the ECB's current monetary policy stance. We intend to perform follow-up research to analyze the survey data to determine whether and how the current ultra-low interest rate environment affects economic decisions and behavior of Austrian households.

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[24] The survey was conducted before potential negative interest rates were widely discussed. This has changed meanwhile, among other things because of media coverage of banks' reservations about accepting negative interest rates on existing loan contracts and first decisions by courts on this matter. These developments might change the attitude of households on negative interest rates.

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Annex

Income variable

For most variables, we use the answers referring to the respondent. Apart from variables that only make sense at the household level (e.g. ownership of the primary residence), the only exception from this rule is income. We use household income to indicate the overall economic situation of the household.

The survey asked households to specify incomes (the personal income of the respondent as well as the household income) in 20 categories and additionally offered the possibility to refuse answering. We recategorized the survey data into the following three income categories:

- below EUR 1,950 (base category in logit estimations)
- EUR 1,950 to EUR 3,300
- EUR 3,300 and above

A problem arose because 570 (28.4%) of the 2,005 households in the sample did not provide any data on household income. Since we cannot assume that the refusal to answer the question on income is random, we preferred not to exclude households whose income data are missing. Consequently, we imputed missing income information using the Stata statistical software program package for multiple imputations. To impute missing income information, we performed ordered logistic regressions

with the following explanatory variables: the number of income recipients in the household, the employment status of the target person (employed full-time or part-time, retired, student, unemployed, qualified task, managerial task, farming) as well as age, age squared, gender, education, marital status, city size and ownership of the primary residence. The number of imputations is 20.

Size of the sample

Overall, 2,005 people took part in the survey. Apart from missing income, refusal to answer the question or "don't knows" also affected the variables *loan* (49 refusals), *intention to take out a loan* (87), *intention to change investment* (182). Overall, we miss at least one of these variables for 257 households. Unlike in the case of income, we cannot impute the missing observations. Ultimately, 1,748 interviews entered the econometric analysis.

Descriptive summary statistics

Summary statistics explanatory variables

% of respondents

Age	
<30	20
30–39	15
40–49	19
50–59	17
60–69	13
>70	17
Education	
Compulsory schooling at most	15
Apprenticeship	59
Secondary schooling	17
University	9
Household income	
<EUR 1,950	38
EUR 1,950 – EUR 3,300	26
EUR 3,300 and above	10
Don't know/no answer	27
Employed	62
Gender	
Male	49
Female	51
Target person	
Yes	72
No	28
City size (base category: population of up to 5,000)	
<5,000	40
5,000 – 50,000	25
>50,000	34
Loans and investment	
Ownership	61
Loan	77
Intention to take out a loan	7
Savings accounts	75
Intention to change investment	8

Source: Own calculations based on the OeNB barometer survey.