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Individual Credit Market Experience and Perception of Aggregate Bank Lending: Evidence from a Firm Survey*

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Abstract

We show that firms' credit market experience determines their perception of aggregate bank lending policy using panel data from the Austrian Business Survey between 2011 and 2016. Loan rejections have a strongly negative and persistent effect on perceptions. Interestingly, firms that receive a loan at worse than anticipated conditions show a similarly negative effect. Firms that do not need a loan tend to perceive lending policy as neutral and revise their perceptions less often. Our findings are in line with theories on sticky information, rational inattention and pessimism bias and suggest considering experience for the aggregation of perceptions.

Keywords: Perception of lending policy, formation of perceptions, sticky information, rational inattention, pessimism bias, behavioral macroeconomics.

JEL Classification: G21, E51, D03.

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1. Introduction

Firms and policy makers base their economic decisions on current and future developments.¹ For current developments it is usually assumed that they are (readily) observed. However, this needs not be the case. For example, inflation perceptions by households and firms often deviate from actual realizations (Jonung, 1981; Coibion et al., 2018). Nevertheless, policy makers often have to rely on perceptions because data on the variables of interests are not directly observable, only available after a significant delay, or not fully reliable.

A particularly important economic variable for firms' decisions is access to credit. It has also become a major concern for policy since the financial crisis as limited access to credit has severely negative effects on the real economy (see, for instance, De Grauwe, 2012, Sette and Gobbi, 2015; Popov and Rocholl, 2018; Siemer, 2018). Here survey-based perceptions of the banks' lending policy provide a timely measure of the supply side. The vastly growing empirical literature on the formation of expectations suggests that also perceptions follow behavioral patterns and are influenced by own experiences. To shed more light on what perceptions actually measure, we want to know how firms form their perceptions of banks' lending policy. Are they influenced by the firm's own recent credit market experience? Do positive and negative experiences have symmetric effects on the firms' perceptions? Why and when do firms update their perceptions?

To address these questions, we use unique data from the WIFO Business Survey for the period 2011 to 2016 in Austria where bank credit is, as in other bank-based financial systems in Europe, by far the most important source of external finance (ECB, 2017). The firms are asked how they perceive the lending policy of banks and to report their individual credit market experience, i.e. whether they have signed a loan contract during the last three months, whether they received a loan, and whether the loan conditions were as anticipated or not.

Our analysis provides three new insights into how firms form their perceptions of banks' lending policy. First, like consumers, firms – or better managers - form their perceptions

¹ For evidence on the real effects of expectations see Gennaioli et al. (2015), Chiang et al. (2011), Souleles (2004) and Malmédier and Nagel (2011).

based on their experience in the credit market. Second, negative experience is more important than positive experience. Not surprisingly, a credit rejection is associated with a higher probability that firms perceive lending policy as being restrictive. Interestingly, this effect is not limited to a rejection. Even if a firm gets a loan but conditions are worse than anticipated, its perception is more likely to be negative despite receiving a loan. Thus, our results demonstrate that a pessimism bias arises not only if a firm does not get a loan but more generally if the terms of the loan they receive are worse than initially anticipated. Third, we find that firms tend to perceive lending policy as neutral, when they do not need a loan. Similarly, firms that need a loan are more likely to revise their perceptions. These effects are strongly robust to different subsamples and data definitions. Our findings are in line with the concepts of sticky information, rational inattention and a pessimism bias in the formation of perceptions. The different response behavior of firms with or without current credit market experience shows that adding a question about whether a firm has recently been active on the credit market would help policy makers in evaluating aggregate bank lending policy.

The paper is organized as follows. In section 2 we review the related literature. We derive the testable hypotheses in section 3. The empirical analysis with results and robustness tests is presented in section 4. We conclude in section 5.

2. Literature Review

Our paper is related to the literature on the formation of perceptions and expectations. The evidence shows that perceptions and expectations are positively correlated. Most papers focus on how inflation expectations are formed.² The expectations of professional forecasters are closest to actual inflation rates (Coibion et al., 2018) and they are adopted by households over time (Carroll, 2003). The common conclusion of these papers is a rejection of the full-information rational expectations hypothesis. Most papers suggest that this is due to information frictions.

² While lab experiments analyze formation of expectations of individual subjects, De Grauwe (2012) applies behavioral concepts also to macroeconomic developments.

One source of information is public information. Research uses either information experiments in the lab and in the field (Armantier et al., 2016; Cavallo et al., 2017; Georganas et al., 2014), the perception of news by survey respondents (Easaw and Ghoshray, 2010) or variation in the extent and tone of media coverage (Lamla and Lein, 2014) to measure the availability of information. Public information impacts expectations and makes them more accurate. However, accuracy does not increase if news are badly toned (Lamla and Lein, 2014). Experiences are another source of information, including experiences that are recent as well as ones that lie in the past. Recent consumption experiences, such as an increase of the oil price, indeed have an effect on households' inflation expectations (Coibion and Gorodnichenko, 2015). In a lab experiment, consumers' inflation perceptions are biased by the frequency of a purchase (Georganas et al., 2014). In a cross-country study, consumers in a high inflation country are shown to have a more realistic perception of inflation than those in a country with low inflation (Cavallo et al., 2017). Comparing age cohorts of survey respondents shows that inflation expectations depend on the respondent's age and are influenced more heavily by recent inflation experiences (Malmendier and Nagel, 2016). Exploiting the panel and time dimensions of their survey, Madaira and Zafar (2015) show that the weight given to experience amassed over a lifetime and different sources of information differs between demographic groups. The effects pertain to other macroeconomic variables: expectations about house prices in the U.S. are extrapolations of the recent developments of house prices in the respondent's municipality, and the volatility of house prices influences the distribution of expectations. Moreover, expectations about the country-wide unemployment rate are higher if the respondent herself is unemployed (Kuchler and Zafar, 2015).

Our paper is also closely related to the lab experiment conducted by Kuhnen (2015) who analyzes how experience affects the perception of risk and shows that negative experience induces pessimism bias. She finds that subjective beliefs about risky assets are overly pessimistic if the subject has experienced a loss, and that belief errors are larger.

The impact of individual experience has so far been studied mainly in the context of expectation. We add to this literature by studying perceptions instead of expectations, and firms instead of households. Moreover, we study bank lending policy which has not been analyzed so far. We show that the theoretical predictions on the formation of expectations

also apply to perceptions on other macroeconomic variables. Having data from a regularly conducted survey allows us to follow firms over time and thus to control for unobserved firm characteristics in a panel setting. With the focus on bank lending policy our paper is also related to the literature on measuring access to credit (for comparisons see, for example, Farre-Mensa and Ljungqvist, 2016; Hainz and Nabokin, 2013).

3. Testable Hypotheses

Information plays a crucial role in the formation of both perceptions and expectations. We use the theoretical literature on expectation formation to derive testable hypotheses on the formation of perceptions (Coibion and Gorodnichenko, 2012). In general, firms can use new information, their individual experience and public information to form perceptions. The costs of getting and using this information will differ. For instance, previous experience is freely and readily available whereas some costs arise for exploring new information. There are search costs for public information too, even if it is freely available. The weights of the three components depend on when firms update their information and therefore may differ across firms (Madeira and Zafar, 2015). Our data contain the firms' perceptions of the banks' lending policy as well as the experience on the credit market three months prior to the survey with the possible experience categories ranging from receiving credit at anticipated terms, worse terms, or non-acceptable terms to rejections by the bank or discouragement of the firms (for more details see section 4.1). Based on the arguments for sticky information and the fact that experience creates information without additional costs, we formulate the following hypothesis.

Hypothesis 1: A firm's perception of lending policy reflects its own experience on the credit market.

As agents face some costs when they acquire, update or process new information on economic developments, they weight the costs and benefits of using additional information. As a result, it may be rational to ignore new information under some circumstances. With rational inattention, the agents are less likely to update their information than in a frictionless world (as in Reis, 2006; Mankiw and Reis, 2002;

Maćkowiak and Wiederholt, 2009). With respect to lending policy, once the firm needs a loan, it pays more attention to the credit market.

In our surveys, firms report the results of credit negotiations during the last three months or state that they did not need credit. Credit negotiations are likely to start after a process in which firms prepare for negotiations with banks. Initially, the firm receives imperfect signals about the readiness of the bank to grant a loan. Eventually the process ends with an offer by the bank which also specifies the terms of the loan, a rejection by the bank or a withdrawal by a discouraged firm. If we suppose that firms get new and informative signals when preparing for and during credit negotiations, the rational inattention argument leads to the next hypothesis.

Hypothesis 2: A firm is more likely to update its perception if it needs a loan.

The surveyed firms report several categories of worse than anticipated experience, ranging from loans at worse terms and/or with lower credit volume than initially anticipated to outright rejections. As long as the firm receives a loan, it can realize its plans. From this perspective, the perceptions should become more negative, i.e. a restrictive perception becomes more likely whereas an accommodating perception becomes less likely, as a firm's experience differs more from what it has anticipated. This means, for example, that the perception of lending policy should be highly different for firms with worse conditions and firms that were rejected by the bank.

However, the previous literature documents a different impact of positive and negative experiences. A setting similar to ours has been studied by Kuhnen (2015). In a lab experiment, participants get signals about the profitability of their assets, but the results show that they do not update their beliefs rationally. The participants of the experiment have the possibility to invest into a risky stock and a safe bond. The returns of the assets are random because they are either from a "good" or "bad" distribution differing in the chance to receive a gain. The participants get a calculation for each of the six rounds, stating what the Bayesian posterior probabilities are of having a "good" asset after observing a certain number of gains. Finally, the participants are asked to assign the probabilities of having an asset with a good distribution. As expected, participants are less likely to report that they have a stock with a good distribution after they have

observed a loss. Furthermore, the subjective beliefs are also less aligned with the objective posterior probabilities when participants have experienced a loss. This can be interpreted as investors becoming pessimistic if they face a loss. Thus, the behavior observed in the lab experiment is not in line with subjects acting rationally.

In our context, a pessimism bias implies that firms that had any negative experience perceive bank behavior more likely as restrictive. In other words, firms with credit market experience that differs from what they have anticipated perceive the lending policy as similarly restrictive independent of how important this difference is. The following hypothesis describes how firms that learn rationally from their experience form their perceptions. If the hypothesis is not supported, the formation of perceptions is subject to a pessimism bias.

Hypothesis 3: A firm's perception is more likely to be negative if its experience differs more strongly from what it has anticipated.

4. Empirical Analysis

4.1. Data Description

We use data from the WIFO Business Survey between November 2011 and November 2016. It provides a unique source of information on the perception of banks' lending behavior by Austrian firms. We have about 28,000 observations in this data set (see descriptive statistics in statistical appendix, Table A.1). The survey is conducted monthly, but the credit questions are asked at a quarterly frequency (for February, May, August and November), so that our data set consists of quarterly data.

Questions on bank lending policy have become increasingly popular in similar business surveys in the EU (Fidrmuc and Hainz, 2013, for Germany).³ The WIFO survey features the following question: *"How do you assess the readiness of banks to provide loans to*

³ The business survey is conducted throughout the European Union. However, the question about the credit market experience has so far been only asked in Austria. Microdata from the business survey is available also for Germany and is used in Bachmann et al. (2013), Bachmann and Elstner (2015), Bachmann et al. (2018), Carstensen et al. (2013) and Strasser (2013).

firms?” The possible answers include *accommodating, normal, and restrictive*.⁴ Moreover, the unique feature of the WIFO survey is that it additionally includes a question on the firms’ credit market experience. Namely, the firms are asked: “*Did you sign a loan agreement in the last three months?*” The eight possible answers include several “yes” categories (*at anticipated terms, at anticipate volume but with worse terms, worse terms but anticipated volume, lower volume and worse terms*) and several “no” categories (*no need, non-acceptable terms, rejection by the bank, no realistic chance*). Thus, there is one category where the firms get the loan at anticipated terms. In three categories, the firms’ prior beliefs are not fully met (that is, terms, credit volume, or both) but the firms get a loan. And there are different categories for firms without loans, ranging from rejections either by the bank or the firm to discouraged firms. Because the number of observations is small for these detailed categories of credit market experience, we also define broad experience categories, which include loans at anticipated conditions (which are terms and volume), loans at worse than anticipated conditions (all in the approving category apart from terms as anticipated), and credit constrained firms (all adverse categories).

The survey also includes several other questions, among which especially the firms’ future business situation is interesting for our analysis. In particular, the firms’ prospects determine their creditworthiness. The firms might get only a noisy signal about the bank’s lending policy and the precision of the noise may vary across firms depending on their creditworthiness.⁵ As a result, the firms’ perception of the banks’ lending behavior could be positively correlated with the firms’ future business situation. Thus, the question on the (future) state of business is included as a control variable. This question is stated as: “*Our business will develop in the next six months as follows: it will improve, it will be stable (given the seasonal effects), it will worsen*”. As the WIFO Institute guarantees confidentiality, we can reasonably assume that firms do not answer strategically.

Altogether we have 21 quarterly surveys with anonymous but identified firms including several firm characteristics (firm size, sector, and region). This allows us to exploit the

⁴ For inflation expectations Dräger and Lamla (2012) show that individuals adjust qualitative questions less often than quantitative questions.

⁵ This would be suggested by the idea of noisy information as, for instance, in Sims (2003).

time dimension and to conduct panel analysis. The coverage of the data is relatively good. Reflecting that we lose at least one survey for the computation of lagged variables, we can still use on average 8.5 (maximum 20) observations per firm (for descriptive statistics see Table A.1).

Figures 1 and 2 present the surprisingly contradictory developments of the firms' credit market experience and the perception of the lending policy. On the one hand, Figure 1 shows that approximately 17 percent of firms signed a new credit contract in each of the surveyed periods, the majority of them at anticipated terms. On the other hand, the share of firms perceiving the lending policy as accommodating was only 10 percent. Similarly, in Figure 2 only 1 percent of our observations are rejections by the banks, which is less than the share of firms that did not accept the lending terms offered by the bank (approximately 2 percent). Relative to the firms that need a loan, the share of rejections is only 5 percent and the share of firms that find the terms unacceptable is 10 percent. The share of discouraged firms is also relatively small at 2 percent of all observations. Despite this, approximately one third of firms (30 percent) view the lending policy as restrictive. The individual survey data show surprising dynamics of the firm's credit market experience behind relatively stable macroeconomic trends. Firms with loans had on average 3.6 loans within the ten surveys in our dataset. Nearly one third of firms with loans had at least one period when they did not receive a loan despite having requested one. Similarly, nearly all firms that need a loan but do not have a loan in a particular period had loans in another period. Despite these dynamics, a large share of firms report that they have no need throughout the analyzed periods (39 percent).

Additionally, we merge the business survey data with the main results of the bank lending survey conducted jointly by the European Central Bank and the Austrian National Bank. We use the responses to the question on lending conditions.⁶ The information on the

⁶ The question reads: "Over the past three months, how have your bank's credit standards as applied to the approval of loans or credit lines to enterprises changed? Please note that we are asking about the change in credit standards, rather than about their level." The answers include tightened considerably (to this response, we attribute value (-2), tightened somewhat (-1), unchanged (0), eased somewhat (1), and eased considerably (2). The most important drawback of this survey is possibly that the number of surveyed banks is very low (5 and 7 banks before and after the first quarter 2013, respectively).

lending survey is available separately for small and medium enterprises (SMEs) and for large firms, although the differences are relatively small.⁷

4.2. Empirical Strategy

We start our analysis with estimations of linear probability models by OLS.⁸ The dependent variable, *lpol*, is equal to one if a firm perceives the lending policy as accommodating (or restrictive), and zero otherwise. Alternatively, we include all three categories (ordered as restrictive, normal, and accommodating). Our main variable of interest is the firm’s experience in the credit market, *experience*, that is, a dummy variable for the eight indicators described in section 4.1. Because the definition of the individual categories is narrow, we also use broader categories including “as anticipated” if terms are as anticipated, “not as anticipated” if conditions are worse and/or volume is lower, and “credit constrained” if the conditions are non-acceptable, the firm is rejected by the bank, or it is discouraged. We use the category “no need” as the base category. Moreover, we include the bank lending survey as a control variable capturing potentially publicly available information on bank lending policy in some specifications.

In addition to the K categories of credit market experience (seven categories of narrowly defined or three categories of broadly defined experience), the core explanatory variables include the expectation of the business situation of the firm in the previous quarter as a proxy for creditworthiness, *business*, and contemporaneous employment (in logs) as a measure for firm size, *size*, as well as other controls \mathbf{Z} . Moreover, we include time effects for the individual regions (nine federal states) and sectoral effects. The estimation equation can be stated as

$$lpol_{it} = \sum_{k=1}^K \alpha_k experience_{kit} + \beta_1 business_{it-1} + \beta_2 size_{it} + \mathbf{Z}_{it}\gamma + \varepsilon_{it}. \quad (1)$$

⁷ The Bank lending survey defines SMEs as the firms with a turnover less than EUR 50 million. As balance sheet data is not available for the business survey, we consider as SMEs firms with less than 250 employees. Thus, approximately 90 percent of our observations are classified as SMEs.

⁸ The results for probit and ordered probit estimations are available upon request and they are largely similar to presented results and do not lead to different conclusions.

In the next step, we estimate linear probability models for the transitions of lending policy perceptions. In this approach, the dependent variable, $dpol$, is one if perceptions of lending policy change, starting from a given perception, in a specific direction and is zero if observations did not fit the specific transition. $dpol$ is defined only for firms that initially had the same perception. For example, for the transition from normal to restrictive (as denoted by $N \rightarrow R$) $dpol$ is defined for the set of firms that perceived the lending policy as normal (N) initially. It equals one for the transition $N \rightarrow R$ and zero for the transitions $N \rightarrow A$ and $N \rightarrow N$. $dpol$ is defined for all possible transitions and the estimation equation can be stated as

$$dpol_{it} = \sum_{k=1}^K \alpha_k experience_{kit} + \beta_1 business_{it-1} + \beta_2 size_{it} + \mathbf{Z}_{it}\gamma + \varepsilon_{it}, \quad (2)$$

where all explanatory variables are defined as above.

4.3. Results for Perceived Bank Lending Policy

Table 1 reports the estimation results for the narrow and broad credit experience categories, respectively. The dependent variable is defined either as being accommodating (columns (1) and (4)), as being restrictive ((2) and (5)), or as a categorical variable including all three categories ((3) and (6)). The results show the important role that the firm's credit market experience plays in the formation of perceptions for the overall economy. If the bank offers credit at terms that the firm anticipates, the probability that a firm evaluates the lending policy as accommodating is 18 percentage points higher. By contrast, negative experience is clearly correlated with a worse perception of the lending policy: The probability to report lending policy as accommodating is 4 percentage points lower for firms with worse credit terms and 7 percentage points lower for those with worse terms and lower volume. Lower volume alone is insignificant. For firms with non-acceptable terms the probability for an accommodating perception is 7 percentage points lower. Discouraged firms are 8 percentage points less likely to perceive lending policy as accommodating and rejected firms 9 percentage points. Actually, there is no firm that evaluates the lending policy as accommodating, if in the same quarter its credit request has been rejected by a bank. Overall, our results demonstrate that firms have worse perceptions of aggregate bank lending policy not only in cases when they do not get a loan because they were rejected or are discouraged. Even if a firm gets a loan but

the terms or/and the amount are not as anticipated, its perceptions are similar to those that do not get loan.

Column (2) shows mirror effects for the lending policy being perceived as restrictive. In particular, for firms with positive experience the probability that lending policy is evaluated as restrictive is 7 percentage points lower. Moreover, after a credit rejection the probability that the firm evaluates the lending policy as restrictive is 71 percentage points higher. The average marginal probability effects are only slightly lower if lending conditions are worse (62 percentage points). The decomposition of this impact into terms and volume shows that both effects are similarly important (35 and 31 percentage points, respectively). As for accommodating perceptions of lending policy, the overall impact is about the same as for firms which view the terms of the loan as non-acceptable (61 percentage points). Discouraged firms have a slightly lower coefficient (53 percentage points).

Moreover, the results show that firms with positive business expectations are 3.1 percentage points more likely to evaluate the lending policy as accommodating and 3.8 percentage points less likely to evaluate it as restrictive. Firm size is insignificant in all three specifications. The bank lending survey data, columns (4) to (6), is insignificant, but all previous results remain largely unchanged.

The results for the categorical variable in columns (3) and (6) confirm that positive experience significantly improves and negative experience lowers the general perception of the lending policy, respectively. The results are also unchanged if we use broader credit experience categories (see panel B). All broad categories as well as business situation of the firms are highly and robustly significant.

In sum, we find support for *hypothesis 1* that individual experience matters for the perception of the whole economy. Thus, our results are in line with the recent literature which provides ample evidence that personal experience influences expectations of inflation, house prices and unemployment (Malmedier and Nagel, 2016; Kuchler and Zafar, 2015; Madeira and Zafar, 2015). Related to *hypothesis 3* our results provide support for the existence of a pessimism bias as we find that firms which get a loan but terms or/and amount are not as anticipated are more likely to report their perception of banks' lending policy as being restrictive and less likely as accommodating. More importantly, that the magnitudes of the coefficients do not hardly differ between different

degrees of negative experiences. This result is consistent with the notion of pessimism in updating beliefs which Kuhnen (2015) has demonstrated in a lab experiment. It adds to this literature by demonstrating that a pessimism bias also exists in a setting in which there are different degrees of negative experiences and that firms evaluate all negotiation outcomes that are not as anticipated as negative experience.

4.4. Results for Change of Perceived Bank Lending Policy

The transition matrix in Table 2 shows that lending policy perceptions tend to stay stable over time.⁹ More than 80 percent of firms stating that lending policy is normal will keep this perception in the next quarter. Similarly, more than three quarters of firms with restrictive perceptions will report the same in the next survey. Mainly firms receiving a loan at anticipated terms change their perceptions of the lending policy, indeed, nearly half of these firms revise their perceptions.

We analyze the dynamics of lending policy perceptions in Table 3. In a first step, we study whether perception changes differ between firms that need a loan or not. In a second step, we look at the relationship between perception changes and the firm's experiences. We run seven regressions to cover the main possible transitions. For example, in the first regression, denoted as 'N → R', the dependent variable is defined as one if the perception changes from normal to restrictive, while it is zero if perception was normal and it does not change to accommodating.

In panel A, we regress dynamics of the perception on a dummy variable showing that the firms have no need for loans in the current period. We can see that this coefficient is highly significant. It is positive for firms that perceive bank lending policy as normal in the current period – independent of their perceptions in the previous period, see columns (3), (5), and (7). The coefficients for the remaining cases are always negative, and the highest coefficients can be seen for firms locked in the accommodating (-0.159) and

⁹ Similarly, Vellekoop and Wiederholt (2017) report that inflation expectations of Dutch households are also very stable.

restrictive perceptions (-0.140) in both periods. These results clearly demonstrate that firms without need of a loan tend to answer “normal”.

In panel B of table 3, we regress the dynamics on the broad lending experience categories.¹⁰ We find that firms with a negative experience are more likely to downgrade the lending policy perceptions from normal to restrictive or keep it as restrictive. Negative experience also goes along with a lower probability that restrictive perceptions will be upgraded to normal or that they will stay normal. Firms that get loans as anticipated have a higher probability of upgrading the perception as well as higher persistence of accommodating perceptions, and they have a lower probability of downgrading perceptions as well as lower persistence of restrictive perceptions. As we analyze only revisions within one quarter this could also indicate that the process of conducting credit negotiations is rather fast for firms that get a loan as anticipated.¹¹

This result implies that the responses to the perception question are based on different degrees of exposure of the respondents to the issue. In particular, the neutral answer category (normal lending policy) is more frequently chosen by firms that have no recent credit market experience of their own. This should be taken into account when survey data is used as a source for economic policy decisions.

In sum, we find empirical support for *hypothesis 2* that states that firms which need credit are much more likely to adjust their perceptions than firms that do not need credit. Moreover, we show that firms without need for credit are much more likely to switch to a normal assessment of lending policy. This is consistent with the explanation that they obtained no new information, which may be because they made no effort to get new information.

¹⁰ We cannot use the narrow categories as explanatory variables because the overlap with narrow categories results in too low a number of observations for several categories.

¹¹ We considered two quarters in sensitivity analysis with similar results which are available upon request from authors. The number of observations is too small for transitions over longer periods.

4.5. Robustness Analysis

4.5.1 Panel Models

Unobservable factors can influence the impact of previous credit experience on lending policy evaluation. To deal with the omitted variable problems, we estimate (1) using a fixed effects model. Table 4 shows that worse terms, lower volume and non-acceptable conditions no longer have a significant impact on firms' evaluation of lending policy as being accommodating. As before, only loans at anticipated terms are inducing a positive evaluation of the lending policy. All remaining coefficients of credit market experience are negative but smaller than in the pooled estimation.

All categories of credit experience remain significant when we consider the impact on lending policy evaluation as restrictive. The results for the categorical dependent variable including all three categories of lending policy perceptions confirm that all categories of credit market experience are highly significant. Also, the results for broad credit categories are similar to the detailed categories.

The control variables, state of business and size, are insignificant in the panel models, reflecting that the unobservable firm characteristics covered by the fixed effects better explain the firms' perceptions than these two variables. The coefficient on the bank lending survey variable is significant and negative for restrictive perceptions: the easing of lending standards lowers the probability of perceiving lending policy as restrictive. Correspondingly, it is positive and marginally significant in the estimations using all three categories of lending policy perceptions.

4.5.2 Persistence of Credit Market Experience

The lending policy perceptions are likely to be based not only on recent but also on longer-term experience of firms on the credit market. Therefore, we include up to four lags of previous credit experience (see Table 5), which lowers the number of observations to approximately half of the full sample. Positive experience on the credit market seems to have only little impact on the formation of lending policy perceptions, especially when accommodating evaluation is considered. The effects are only marginally significant after one quarter and insignificant if more lags are included. The effects are slightly more important on the restrictive and categorical perceptions. Nevertheless, the effects of positive experience are only short-lived.

By contrast, negative experience has a strong and long-lasting impact on perceptions. Worse credit terms and credit constraints have enduring significant effects which worsen the perceptions of lending policy even after four quarters. As expected, coefficients become smaller and less significant over time.

4.5.3 Subsample with No Recent Credit Experience

Instead of including more lags we can focus on firms which did not need a loan for a certain period (e.g. one or four quarters) and then tried to receive a credit (Table 6). In particular, in this robustness analysis we compare firms without need for credit one and four quarters before the credit experience. A longer absence from the credit market allows us to see the impact of one particular experience on the credit market more clearly. The number of observations also declines in this robustness check to only one quarter of the original sample if four quarters without credit experience are considered. Moreover, selection bias may be important in this analysis.

Despite these limitations, the estimations for subsamples without recent credit market experience are in line with the previous findings. As before, only firms receiving loans at anticipated terms are more positive towards the perceived lending policy. Similarly, firms with worse credit terms and credit constraints have more negative perceptions. The impact on the restrictive perception is again higher than on the accommodating perception. The effects are higher for these subsamples than for the original sample.

4.5.4 Heterogeneity with Respect to Size, Sectors and Regions

Access to credit is known to differ with respect to firm size, type of activity and location. Correspondingly, the experience could also be different for these firms. Our sensitivity analysis estimates coefficients of credit market experience which are specific for selected groups of firms. We consider again only broad loan categories, because the number of observations would be too low otherwise. In general, the results confirm the stability of the previous results. This is also in line with the fact that Austria is a relatively homogenous economy. At the same time, we confirm some differences in the impact of credit market experience especially with regard to sectors and regions.

First, we investigate the role of firm size in the formation of perceptions in more detail. The position of the staff member reporting the perception should differ depending on firm

size. In smaller firms, it might be the owner that both reports his perception and negotiates with the bank. In larger firms, this is less likely the case. Small firms are considered to be more opaque than large firms and may therefore find it more difficult to receive a loan. The previous estimations did not show a significant role of size as measured by the number of employees. Here, we compare three different groups of firms: small (up to 50 employees), medium (from 50 up to 250 employees) and large (250 and more employees). Large firms are more likely to obtain loans as anticipated (12.9 percent) than small firms (9.6 percent). Our estimation results (Table 7) show some differences in coefficients, although they are not robustly significant (test results are available upon request from authors). Positive experience has larger effects on small firms than on the large ones for accommodating as well as all other perceptions. For large firms, positive experience does not significantly affect the probability that lending policy is perceived as restrictive. Similarly, positive experience is only marginally significant for all three values of perceptions reported by large firms. The heterogeneity of the coefficients according to firm size is smaller for loans with worse than anticipated conditions and for credit constrained firms. Actually, for these perceptions the medium-sized firms could be slightly more affected by the lack of finance than small firms, but as mentioned the difference between the coefficients is not statistically significant.

We also consider whether the aggregate results are driven by the differences of credit market experience by sector (manufacturing, construction, and services, Table 8). In this exercise, we again observe the largest differences in coefficients across the sectors for positive experiences (as anticipated), while negative experiences and credit constraints lead to changes in perceptions that are quite similar across sectors (compared to the baseline of firms with no need for credit). For positive experiences, the coefficients suggest that the impact on perceptions is most relevant for service firms followed by industry and construction firms. In the case of construction, interestingly, the results suggest that construction companies are not less likely to assess bank lending behavior as restrictive if they have a positive experience (as anticipated) than the baseline category of firms that have no need for credit.

Finally, we analyze whether the credit market experience is heterogeneous among regions (Table 9). Peripheral regions are generally expected to have worse access to credits. In our case of Austria, we consider three NUTS 1 level regions, which include Eastern

Austria (the capital city of Vienna, lower Austria surrounding Vienna, and Burgenland), Western Austria (Upper Austria around the second largest city, Linz, Salzburg, Tyrol and Vorarlberg), and finally Southern Austria (Carinthia and Styria). From the perspective of the access to finance, the first two broader regions can profit from the presence of the capital city of Vienna, Linz, and Salzburg. Moreover, Western Austria has also the advantage of the geographical proximity to Germany and Switzerland. In general, these expectations are confirmed especially for Eastern Austria and positive experience. However, the difference between the coefficients is not robustly significant.

5. Conclusions

We use unique panel data from a firm survey on perceptions of aggregate lending policy and firms' credit market experience in Austria between 2011 and 2016. While aggregate lending policy perceptions are relatively stable during the analyzed period, the survey data show surprising dynamics in the activities and experiences of individual firms on the credit market. We test three distinct hypotheses and gain new insights on the formation of perceptions. First, firms form their perceptions of lending policy based on their own previous credit market experience, using the information they gain during the credit negotiations. Individual experience has highly persistent effects on perceptions, in particular in case of negative experience. Thus, our findings are also in line with the concept of sticky information.

Second, firms that do not receive a loan at the anticipated conditions are more likely to perceive bank lending policy as restrictive than firms that do not need credit. Our results show that firms consider the rejection of a loan request and worse loan conditions than anticipated as similarly negative experiences. This finding provides further evidence for the pessimism bias that has been studied so far mainly in a lab experiment. Finally, firms are less likely to state that lending policy is normal and are more likely to revise their perceptions if they need credit, as models of rational inattention predict.

The fact that the credit market experience of firms is a driving factor of the perception of bank lending policy implies that survey-based indicators have high information value for the timely assessment of the lending behavior of banking systems for policy interventions. But a word of caution is necessary. Our results also suggest that by aggregating individual

perceptions for the whole economy, the indicators may provide different messages depending on whether all firms or only firms with credit demand are considered when constructing the indicator. This is due to the fact that firms base their perception on their own experience and firms without own experience tend to report normal perceptions of lending policy. Thus, a perception-indicator can best be interpreted when taking into account whether a firm is informed. For survey design, this implies that information on the firm's own experience should be collected. When dealing with surveys related to credit finance this means that at least one question on whether a firm has credit demand should be part of the questionnaire.

Our analysis has highly relevant policy implications for bank-based financial systems as proxied by Austria. The results suggest that due to sticky information and rational inattention, a short period of constrained credit supply may have a lasting impact on the perceptions of a firm about access to credit and thereby influence credit demand. Because of pessimism not only loan rejections but also worse conditions are perceived negatively. As such, a firm's credit market experience could be one of the channels contributing to the stagnating investment despite low interest rates and thereby explain the slow recovery of the economy after the financial crisis. However, further research is needed in order to assess the magnitude of this channel.

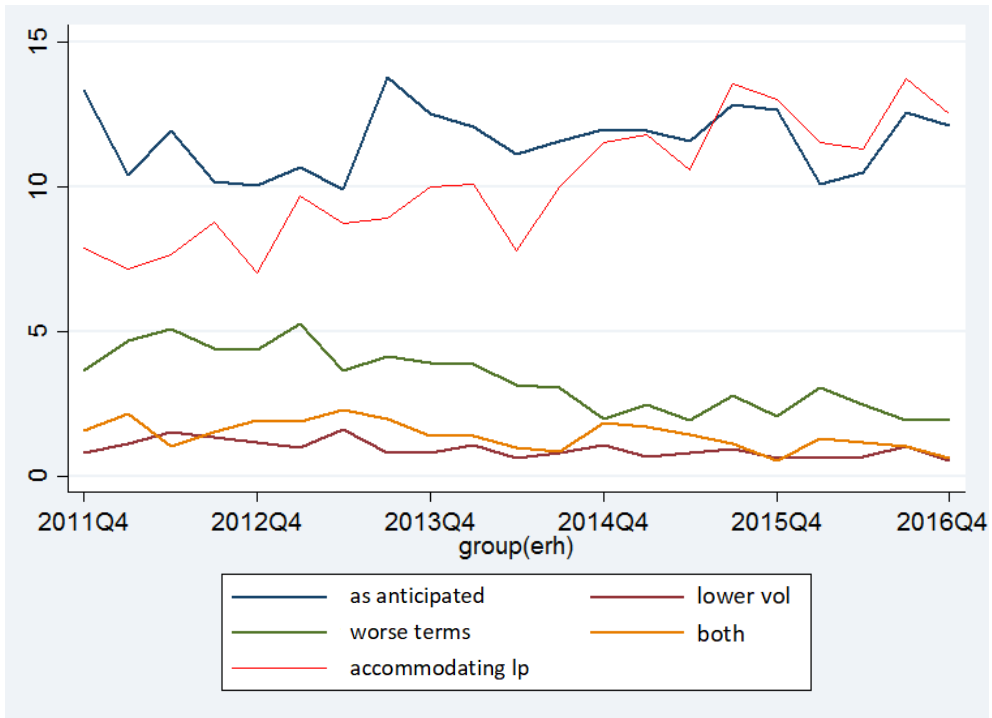
References

- Armantier, Olivier, Nelson, Scott, Topa, Giorgio, van der Klaauw, Wilbert, and Zafar, Basit, 2016. The Price Is Right: Updating Inflation Expectations in a Randomized Price Information Experiment, *Review of Economics and Statistics* 98(3), 503-523.
- Bachmann, Rüdiger, Born, Benjamin, Elstner, Steffen, and Grimme, Christian, 2018. Time-Varying Business Volatility and the Price Setting of Firms, *Journal of Monetary Economics*, forthcoming.
- Bachmann, Rüdiger, and Elstner, Steffen, 2015. Firm Optimism and Pessimism, *European Economic Review* 79, 297-325.
- Bachmann, Rüdiger, Elstner, Steffen, and Sims, Eric, 2013. Uncertainty and Economic Activity: Evidence from Business Survey Data, *American Economic Journal: Macroeconomics* 5(2), 217-249.
- Carroll, Christopher D. 2003. Macroeconomic Expectations of Households and Professional Forecasters, *Quarterly Journal of Economics* 118(1), 269-298.
- Carstensen, Kai., Elstner, Steffen, and Paula, Georg, 2013. How Much Did Oil Market Developments Contribute to the 2009 Recession in Germany?, *Scandinavian Journal of Economics* 115 (3), 695-721.
- Cavallo, Alberto, Cruces, Guillermo, and Perez-Truglia, Richardo, 2017. Inflation Expectations, Learning, and Supermarket Prices: Evidence from Field Experiments. *American Economic Journal: Macroeconomics* 9(3), 1-35
- Chiang, Yao-Min, Hirshleifer, David, Qian, Yiming, and Sherman, Ann E., 2011. Do Investors Learn from Experience? Evidence from Frequent IPO Investors. *Review of Financial Studies* 24 (5), 1560-1589.
- Coibion, Olivier, Gorodnichenko, Yuriy, and Kumar, Saten, 2018. How do Firms Form Their Expectations? New Survey Evidence, *American Economic Review*, forthcoming.
- Coibion, Olivier, and Gorodnichenko, Yuriy, 2015. Information Rigidity and the Expectations Formation Process: A Simple Framework and New Facts, *American Economic Review* 105(8), 2644-2678.
- Coibion, Olivier, and Gorodnichenko, Yuriy, 2012. What Can Survey Forecasts Tell Us about Information Rigidities?, *Journal of Political Economy* 120(1), 116-159.

- De Grauwe, Paul, 2012. Lectures on Behavioral Macroeconomics. Economics Books No 9891, Princeton University Press, Princeton.
- Dräger, Lena, and Lamla, Michael J., 2012. Updating Inflation Expectations: Evidence from Micro Data, *Economics Letters* 117, 807-810.
- Easaw, Joshy, and Ghoshray, Atanu, 2010. News and Households' Subjective Macroeconomic Expectations, *Journal of Macroeconomics* 32 (1), 469-475.
- European Central Bank, ECB, 2017. Survey on the Access to Finance of Enterprises in the Euro Area, April to September 2017, European Central Bank, Frankfurt.
- Farre-Mensa, Joan, and Ljungqvist, Alexander, 2016. Do Measures of Financial Constraints Measure Financial Constraints?, *Review of Financial Studies* 29(2), 271-308.
- Fidrmuc, Jarko, and Hainz, Christa, 2013. The Effect of Banking Regulation on Cross-Border Lending, *Journal of Banking and Finance* 37(5), 1310-1322.
- Gennaioli, Nicola, Ma, Yueran, and Shleifer, Andrei, 2015. Expectations and Investment, *NBER Macroeconomics Annual* 30, 379-442.
- Georganas, Sotiris, Healy, Paul J., and Li, Nan, 2014. Frequency Bias in Consumers' Perceptions of Inflation: An Experimental Study, *European Economic Review* 67, 144-158.
- Hainz, Christa and Nabokin, Tatjana, 2013. Measurement and Determinants of Access to Credit, CESifo Working Paper No. 4190.
- Jonung, Lars, 1981. Perceived and Expected Rates of Inflation in Sweden, *American Economic Review* 71(5), 961-968.
- Kuchler, Theresa, and Zafar, Basit, 2015. Personal Experiences and Expectations about Aggregate Outcomes. Federal Reserve Bank of New York Staff Reports 748, October 2015.
- Kuhnen, Camilla M., 2015. Asymmetric Learning from Financial Information, *Journal of Finance* LXX (5), 2029-2061.
- Lamla, Michael J., and Lein, Sarah M., 2014. The Role of Media for Consumers' Inflation Expectation Formation, *Journal of Economic Behavior and Organization* 106, 62-77.
- Maćkowiak, Bartosz, and Wiederholt, Mirko, 2009. Optimal Sticky Prices under Rational Inattention, *American Economic Review* 99(3), 769-803.

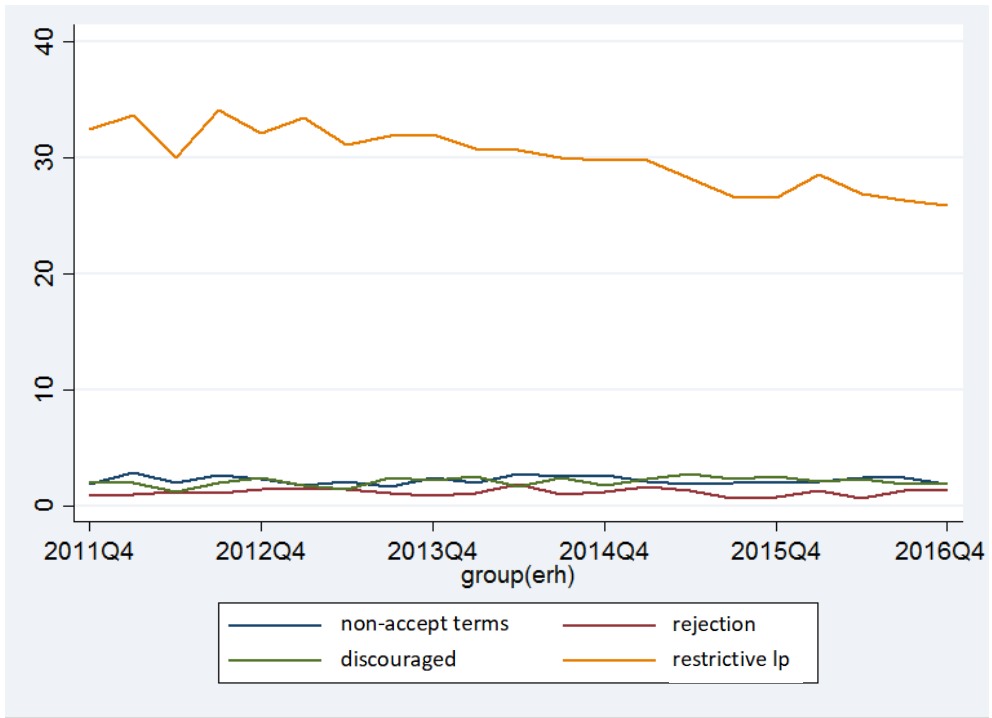
- Madeira, Carlos, and Zafar, Basit, 2015. Heterogeneous Inflation Expectations and Learning, *Journal of Money, Credit and Banking* 47(5), 867–896
- Malmendier, Ulrike and Nagel, Stefan, 2016. Learning from Inflation Experiences, *Quarterly Journal of Economics* 131(1), 53-87.
- Malmendier, Ulrike and Nagel, Stefan, 2011. Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?, *Quarterly Journal of Economics* 126(1), 373-416.
- Mankiw, N. Gregory, and Reis, Ricardo, 2002. Sticky Information versus Sticky Prices: A Proposal to Replace the New Keynesian Phillips Curve, *Quarterly Journal of Economics* 117 (4), 1295-1328.
- Popov, Alexander, and Rocholl, Jörg, 2018. Do Credit Shocks Affect Labor Demand? Evidence for Employment and Wages During the Financial Crisis, *Journal of Financial Intermediation* 36, 16-27.
- Reis, Ricardo, 2006. Inattentive Producers, *Review of Economic Studies* 73 (3), 793-821.
- Sette, Enrico, and Gobbi, Giorgio, 2015. Relationship Lending During a Financial Crisis, *Journal of the European Economic Association* 13(3), 453-481.
- Siemer, Michael, 2018. Employment Effects of Financial Constraints During the Great Recession, *Review of Economics and Statistics* 88(4), 641-658.
- Sims, Christopher A., 2003. Implications of Rational Inattention, *Journal of Monetary Economics* 50(3), 665-90.
- Souleles, Nicholas S., 2004. Expectations, Heterogeneous Forecast Errors, and Consumption: Micro Evidence from the Michigan Consumer Sentiment Surveys, *Journal of Money, Credit, and Banking* 36(1), 39-72.
- Strasser, Georg, 2013. Exchange Rate Pass-Through and Credit Constraints: Firms Price to Market as Long as They Can, *Journal of Monetary Economics* 60(11), 25-38.
- Vellekoop, Nathanael and Wiederholt, Mirko, 2017. Inflation Expectations and Choices of Households: Evidence from Matched Survey and Administrative Data, *Society for Economic Dynamics Annual Meeting 2017, Meeting Papers No 1449*, Edinburgh.

Figure 1: Having a Loan and Accommodating Lending Policy Perception



Source: WIFO, own computation.

Figure 2: Having No Loan and Restrictive Lending Policy Perception



Source: WIFO, own computation.

Table 1: Determinants of Lending Policy Perceptions, OLS**A. Narrow Categories of Credit Market Experience**

	(1)	(2)	(3)	(4)	(5)	(6)
dependent variable	accm. ^a	restr. ^a	all ^b	accm. ^a	restr. ^a	all ^b
as anticipated	0.180*** (12.654)	-0.069*** (-5.382)	0.248*** (11.637)	0.180*** (12.649)	-0.068*** (-5.370)	0.248*** (11.623)
worse terms	-0.040*** (-3.808)	0.354*** (13.469)	-0.395*** (-12.534)	-0.040*** (-3.813)	0.354*** (13.472)	-0.395*** (-12.539)
lower volume	-0.003 (-0.126)	0.313*** (7.378)	-0.316*** (-6.033)	-0.003 (-0.129)	0.313*** (7.383)	-0.316*** (-6.038)
both	-0.071*** (-10.523)	0.615*** (27.208)	-0.685*** (-27.941)	-0.071*** (-10.513)	0.614*** (27.202)	-0.685*** (-27.939)
non-accept. terms	-0.067*** (-10.359)	0.614*** (26.210)	-0.681*** (-26.495)	-0.067*** (-10.346)	0.614*** (26.197)	-0.681*** (-26.472)
rejection	-0.088*** (-11.486)	0.711*** (43.206)	-0.799*** (-40.184)	-0.088*** (-11.491)	0.711*** (43.206)	-0.799*** (-40.194)
discouraged	-0.076*** (-8.980)	0.530*** (16.670)	-0.606*** (-17.203)	-0.076*** (-8.979)	0.529*** (16.663)	-0.606*** (-17.195)
business exp. (lag)	0.031*** (5.656)	-0.038*** (-4.329)	0.069*** (5.948)	0.031*** (5.650)	-0.038*** (-4.325)	0.069*** (5.944)
employment (log)	-0.000 (-0.086)	-0.007 (-1.338)	0.007 (1.000)	-0.000 (-0.036)	-0.008 (-1.402)	0.008 (1.076)
bank lending survey				0.017 (0.378)	-0.050 (-0.761)	0.067 (0.779)
No of obs.	19,719	19,719	19,719	19,719	19,719	19,719
R ²	0.077	0.192	0.183	0.077	0.192	0.183

B. Broad Categories of Credit Market Experience

	(1)	(2)	(3)	(4)	(5)	(6)
dependent variable	accm. ^a	restr. ^a	all ^b	accm. ^a	restr. ^a	all ^b
As anticipated	0.180*** (12.655)	-0.068*** (-5.377)	0.248*** (11.639)	0.179*** (12.650)	-0.068*** (-5.365)	0.248*** (11.624)
not as anticipated	-0.042*** (-5.362)	0.417*** (19.719)	-0.459*** (-18.650)	-0.042*** (-5.367)	0.417*** (19.722)	-0.459*** (-18.656)
credit constrained	-0.075*** (-12.558)	0.602*** (31.987)	-0.677*** (-32.142)	-0.075*** (-12.557)	0.602*** (31.974)	-0.677*** (-32.127)
business exp. (lag)	0.031*** (5.680)	-0.039*** (-4.422)	0.070*** (6.022)	0.031*** (5.673)	-0.039*** (-4.418)	0.070*** (6.017)
employment (log)	-0.000 (-0.078)	-0.008 (-1.380)	0.007 (1.038)	-0.000 (-0.025)	-0.008 (-1.454)	0.008 (1.124)
bank lending survey				0.018 (0.406)	-0.056 (-0.854)	0.075 (0.866)
No of obs.	19,719	19,719	19,719	19,719	19,719	19,719
R ²	0.077	0.187	0.179	0.077	0.187	0.179

Note: a - dependent variable equals 1 if a firm perceives lending conditions as accommodating (restrictive) and zero otherwise. b - dependent variable equals 1 for restrictive, 2 for normal and 3 for accommodating perceptions of surveyed firms. Constant, sectoral and regional-time effects are not reported. No-need is used as the base category. *t*-statistics based on clustered standard errors at the firm level are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 2: Transition Matrix of Perception of Lending Policy after 1 Quarter

		perception			total
		restrictive	normal	accommodating	share
lagged perceptions	restrictive	76.9	21.5	1.6	100.0
	normal	10.2	82.6	7.2	100.0
	accommodating	4.1	42.5	53.4	100.0

Table 3: Change of Policy Perceptions (1 Quarter), OLS, Broad Loan Categories**A. Results for no need**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
dependent variable	N → R	N → A	N → N	R → R	R → N	A → A	A → N
no need	-0.092*** (-8.100)	-0.093*** (-8.878)	0.128*** (8.501)	-0.140*** (-8.663)	0.100*** (6.844)	-0.159*** (-4.836)	0.114*** (3.668)
business exp. (lag)	-0.011* (-1.666)	0.012** (2.337)	0.001 (0.118)	-0.014 (-1.039)	0.014 (1.110)	0.043 (1.568)	-0.041 (-1.583)
employment (log)	-0.006** (-2.071)	0.001 (0.566)	0.007* (1.768)	-0.010 (-1.504)	0.005 (0.829)	0.005 (0.319)	-0.000 (-0.029)
No of obs.	10,001	10,001	10,001	4,851	4,851	1,607	1,607
R ²	0.043	0.045	0.043	0.065	0.055	0.178	0.156

B. Results for different experience categories, no need as a base category

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
dependent variable	N → R	N → A	N → N	R → R	R → N	A → A	A → N
As anticipated	-0.010 (-1.218)	0.140*** (9.798)	-0.071*** (-4.268)	-0.161*** (-5.314)	0.156*** (5.295)	0.204*** (6.147)	-0.131*** (-4.142)
not as anticipated	0.310*** (10.590)	-0.006 (-0.500)	-0.256*** (-8.294)	0.190*** (9.291)	-0.141*** (-7.670)	-0.152* (-1.933)	0.028 (0.331)
credit constrained	0.366*** (7.586)	-0.031*** (-2.725)	-0.267*** (-5.814)	0.264*** (17.194)	-0.206*** (-14.818)	-0.158 (-0.827)	-0.150 (-0.851)
business exp. (lag)	-0.009 (-1.410)	0.012** (2.168)	-0.000 (-0.027)	-0.008 (-0.583)	0.008 (0.684)	0.038 (1.364)	-0.038 (-1.495)
employment (log)	-0.003 (-1.194)	0.000 (0.064)	0.006 (1.452)	-0.004 (-0.581)	-0.000 (-0.039)	0.004 (0.236)	-0.000 (-0.022)
No of obs.	10,001	10,001	10,001	4,851	4,851	1,607	1,607
R ²	0.089	0.058	0.050	0.118	0.100	0.192	0.158

Note: A/N/R → A/N/R denotes that perceptions changed from accommodating (A)/normal (N)/restrictive (R) to accommodating/normal/restrictive. The dependent variable is equal to 1 for the respective transition and 0 if no or different transition was reported. Constant, sectoral and regional-time effects are not reported. *t*-statistics based on clustered standard errors at the firm level are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 4: Determinants of Lending Policy Perceptions, Fixed Effects**A. Narrow Categories of Credit Market Experience**

	(1)	(2)	(3)	(4)	(5)	(6)
dependent variable	accm. ^a	restr. ^a	all ^b	accm. ^a	restr. ^a	all ^b
as anticipated	0.136*** (11.691)	-0.084*** (-8.009)	0.221*** (13.116)	0.136*** (11.687)	-0.084*** (-7.995)	0.220*** (13.099)
worse terms	0.001 (0.065)	0.152*** (7.041)	-0.152*** (-6.004)	0.001 (0.064)	0.153*** (7.042)	-0.152*** (-6.005)
lower volume	0.008 (0.402)	0.203*** (5.388)	-0.195*** (-4.257)	0.008 (0.400)	0.203*** (5.400)	-0.195*** (-4.268)
both	-0.018* (-1.957)	0.288*** (11.335)	-0.306*** (-10.774)	-0.018* (-1.951)	0.288*** (11.298)	-0.306*** (-10.737)
non-accept. terms	-0.013 (-1.620)	0.255*** (11.291)	-0.268*** (-10.479)	-0.013 (-1.620)	0.255*** (11.297)	-0.268*** (-10.483)
rejection	-0.038*** (-3.183)	0.325*** (12.575)	-0.363*** (-11.418)	-0.038*** (-3.183)	0.325*** (12.573)	-0.363*** (-11.421)
discouraged	-0.026** (-2.166)	0.257*** (9.276)	-0.283*** (-8.595)	-0.026** (-2.164)	0.256*** (9.261)	-0.283*** (-8.584)
business exp. (lag)	0.010** (2.330)	-0.002 (-0.452)	0.012* (1.732)	0.010** (2.326)	-0.002 (-0.431)	0.012* (1.717)
employment (log)	-0.006 (-0.903)	-0.031*** (-3.239)	0.025* (1.882)	-0.006 (-0.895)	-0.032*** (-3.283)	0.025* (1.918)
bank lending survey				0.010 (0.252)	-0.117** (-2.383)	0.127* (1.838)
No of obs.	19,719	19,719	19,719	19,719	19,719	19,719
No of firms	2,328	2,328	2,328	2,328	2,328	2,328
R ²	0.045	0.066	0.077	0.045	0.066	0.077

B. Broad Categories of Credit Market Experience

	(1)	(2)	(3)	(4)	(5)	(6)
dependent variable	accm. ^a	restr. ^a	all ^b	accm. ^a	restr. ^a	all ^b
as anticipated	0.136*** (11.694)	-0.084*** (-7.915)	0.220*** (13.057)	0.136*** (11.690)	-0.083*** (-7.901)	0.220*** (13.041)
not as anticipated	-0.002 (-0.259)	0.194*** (10.566)	-0.197*** (-9.185)	-0.002 (-0.260)	0.194*** (10.563)	-0.197*** (-9.183)
credit constrained	-0.022*** (-2.606)	0.264*** (14.056)	-0.285*** (-12.578)	-0.022*** (-2.606)	0.264*** (14.048)	-0.285*** (-12.574)
business exp. (lag)	0.010** (2.310)	-0.002 (-0.407)	0.012* (1.685)	0.010** (2.306)	-0.002 (-0.386)	0.012* (1.669)
employment (log)	-0.006 (-0.848)	-0.032*** (-3.356)	0.026** (1.998)	-0.006 (-0.839)	-0.033*** (-3.399)	0.027** (2.034)
bank lending survey				0.011 (0.268)	-0.119** (-2.434)	0.130* (1.884)
No of obs.	19,719	19,719	19,719	19,719	19,719	19,719
No of firms	2,328	2,328	2,328	2,328	2,328	2,328
R ²	0.044	0.064	0.075	0.044	0.064	0.075

Note: a - dependent variable equals 1 if a firm perceives lending conditions as accommodating (restrictive) and zero otherwise. b - dependent variable equals 1 for restrictive, 2 for normal and 3 for accommodating perceptions of surveyed firms. Constant, sectoral and regional-time effects are not reported. No-need is used as the base category. *t*-statistics based on clustered standard errors at the firm level are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 5: Determinants of Lending Policy Perceptions, OLS, Lag Structure, Broad Loan Categories

dependent variable	(1) accommodating ^a	(2) restrictive ^a	(3) all ^b
as anticipated	0.171*** (10.059)	-0.085*** (-6.538)	0.257*** (11.174)
as anticipated, 1 st lag	0.035*** (2.917)	-0.035*** (-2.917)	0.070*** (3.684)
as anticipated, 2 nd lags	0.022* (2.000)	-0.027** (-2.455)	0.049*** (3.063)
as anticipated, 3 rd lag	0.020 (1.538)	-0.012 (-1.091)	0.032* (1.778)
as anticipated, 4 th lag	0.028** (2.333)	0.009 (0.692)	0.019 (1.000)
not as anticipated	-0.005 (-0.417)	0.275*** (10.185)	-0.280*** (-8.750)
not as anticipated, 1 st lag	-0.031*** (-2.818)	0.123*** (5.591)	-0.154*** (-5.923)
not as anticipated, 2 nd lags	-0.029*** (-3.222)	0.123*** (5.857)	-0.152*** (-6.333)
not as anticipated, 3 rd lag	-0.040*** (-3.636)	0.096*** (4.571)	-0.137*** (-5.708)
not as anticipated, 4 th lag	-0.021* (-1.750)	0.089*** (4.238)	-0.110*** (-4.231)
credit constrained	-0.016* (-1.778)	0.308*** (12.320)	-0.324*** (-11.172)
credit constrained, 1 st lag	-0.018** (-2.571)	0.110*** (5.500)	-0.128*** (-5.818)
credit constrained, 2 nd lags	-0.006 (-0.750)	0.142*** (6.762)	-0.148*** (-6.167)
credit constrained, 3 rd lag	-0.019** (-2.111)	0.119*** (5.950)	-0.138*** (-6.273)
credit constrained, 4 th lag	-0.024** (-2.667)	0.134*** (5.583)	-0.157*** (-5.815)
business exp. (lag)	0.027*** (3.375)	-0.034** (-2.615)	0.062*** (3.647)
employment (log)	0.001 (0.250)	-0.005 (-0.714)	0.007 (0.778)
No of obs.	10355	10355	10355
R ²	0.092	0.231	0.227

Note: a - dependent variable equals 1 if a firm perceives lending conditions as accommodating (restrictive) and zero otherwise. b - dependent variable equals 1 for restrictive, 2 for normal and 3 for accommodating perceptions of surveyed firms. Constant, sectoral and regional-time effects are not reported. No-need is used as the base category. *t*-statistics based on clustered standard errors at the firms level are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 6: Determinants of Lending Policy Perceptions, OLS, No Previous Loans, Broad Loan Categories

dependent variable	no loan in previous 1 quarter			no loan in previous 4 quarters		
	(1)	(2)	(3)	(4)	(5)	(6)
	accm. ^a	restr. ^a	all ^b	accm. ^a	restr. ^a	all ^b
as anticipated	0.193*** (10.723)	-0.072*** (-4.836)	0.265*** (10.205)	0.202*** (6.284)	-0.070*** (-2.834)	0.272*** (6.168)
not as anticipated	-0.022 (-1.502)	0.379*** (11.221)	-0.401*** (-10.009)	0.011 (0.307)	0.389*** (5.467)	-0.378*** (-4.255)
credit constrained	-0.058*** (-6.270)	0.539*** (17.505)	-0.597*** (-17.496)	-0.041 (-1.593)	0.469*** (5.914)	-0.510*** (-5.906)
business exp. (lag)	0.029*** (4.103)	-0.038*** (-3.164)	0.067*** (4.364)	0.027*** (2.845)	-0.053*** (-2.816)	0.081*** (3.523)
employment (log)	-0.000 (-0.102)	-0.011* (-1.698)	0.011 (1.320)	0.001 (0.148)	-0.013 (-1.520)	0.014 (1.395)
No of obs.	12,265	12,265	12,265	5,754	5,754	5,754
R ²	0.062	0.099	0.106	0.062	0.092	0.101

Note: a - dependent variable equals 1 if a firm perceives lending conditions as accommodating (restrictive) and zero otherwise. b - dependent variable equals 1 for restrictive, 2 for normal and 3 for accommodating perceptions of surveyed firms. Constant, sectoral and regional-time effects are not reported. No-need is used as the base category. *t*-statistics based on clustered standard errors at the firms level are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 7: Heterogeneity of Credit Experience, Firm Size, OLS, Broad Loan Categories

dependent variable	(1) accommodating ^a	(2) restrictive ^a	(3) all ^b
as anticipated, small	0.200*** (11.140)	-0.095*** (-6.555)	0.295*** (11.472)
as anticipated, medium	0.148*** (5.349)	-0.041* (-1.838)	0.188*** (4.773)
as anticipated, large	0.152*** (3.370)	0.006 (0.107)	0.146* (1.783)
not as anticipated, small	-0.042*** (-4.519)	0.397*** (14.997)	-0.439*** (-14.684)
not as anticipated, medium	-0.047*** (-3.262)	0.450*** (11.649)	-0.498*** (-10.543)
not as anticipated, large	-0.032 (-1.334)	0.440*** (7.590)	-0.472*** (-6.882)
credit constrained, small	-0.069*** (-9.975)	0.568*** (25.497)	-0.637*** (-25.674)
credit constrained, medium	-0.093*** (-11.157)	0.710*** (26.571)	-0.803*** (-27.731)
credit constrained, large	-0.076*** (-2.948)	0.593*** (8.050)	-0.669*** (-8.098)
business exp. (lag)	0.031*** (5.689)	-0.039*** (-4.409)	0.070*** (6.023)
employment (log)	0.002 (0.514)	-0.012** (-2.125)	0.014* (1.944)
Observations	19,719	19,719	19,719
R-squared	0.077	0.188	0.181

Note: a - dependent variable equals 1 if a firm perceives lending conditions as accommodating (restrictive) and zero otherwise. b - dependent variable equals 0 for restrictive, 1 for normal and 2 for accommodating perceptions of surveyed firms. Constant, sectoral and regional-time effects are not reported. No-need is used as the base category. *t*-statistics based on clustered standard errors at the firms level are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 8: Heterogeneity of Credit Experience, Sectors, OLS, Broad Loan Categories

dependent variable	(1) accommodating ^a	(2) restrictive ^a	(3) all ^b
as anticipated/industry	0.165*** (6.875)	-0.051** (-2.429)	0.216*** (5.838)
as anticipated/construction	0.110*** (3.438)	-0.026 (-0.839)	0.136*** (2.776)
as anticipated/services	0.211*** (10.048)	-0.094*** (-5.222)	0.305*** (10.167)
not as anticipated/industry	-0.051*** (-3.923)	0.414*** (11.829)	-0.465*** (-11.625)
not as anticipated/construction	-0.070*** (-4.667)	0.488*** (11.091)	-0.559*** (-11.646)
not as anticipated/services	-0.026** (-2.000)	0.390*** (12.188)	-0.416*** (-10.667)
credit constrained/industry	-0.084*** (-7.636)	0.606*** (15.947)	-0.691*** (-16.854)
credit constrained/construction	-0.078*** (-5.200)	0.623*** (11.755)	-0.701*** (-12.298)
credit constrained/services	-0.068*** (-8.500)	0.594*** (25.826)	-0.663*** (-25.500)
business exp. (lag)	0.031*** (6.200)	-0.039*** (-4.333)	0.070*** (5.833)
employment (log)	-0.000 (-0.000)	-0.008 (-1.600)	0.007 (1.000)
Observations	19719	19719	19719
R-squared	0.068	0.179	0.172

Note: a - dependent variable equals 1 if a firm perceives lending conditions as accommodating (restrictive) and zero otherwise. b - dependent variable equals 1 for restrictive, 2 for normal and 3 for accommodating perceptions of surveyed firms. Sectoral and regional-time effects are not reported. No-need is used as the base category. *t*-statistics based on clustered standard errors at the firms level are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 9: Heterogeneity of Credit Experience, NUTS1-Regions, OLS, Broad Loan Categories

	(1)	(2)	(3)
dependent variable	accommodating ^a	restrictive ^a	all ^b
as anticipated/East	0.221*** (8.500)	-0.116*** (-5.043)	0.337*** (8.868)
as anticipated/South	0.164*** (4.970)	-0.090** (-2.500)	0.254*** (4.456)
as anticipated/West	0.164*** (8.200)	-0.034** (-2.125)	0.198*** (7.071)
not as anticipated/East	-0.034** (-2.429)	0.390*** (10.833)	-0.424*** (-9.860)
not as anticipated/South	-0.023 (-1.353)	0.359*** (8.349)	-0.383*** (-7.365)
not as anticipated/West	-0.060*** (-5.000)	0.472*** (13.486)	-0.532*** (-14.000)
credit constrained/East	-0.080*** (-7.273)	0.569*** (18.967)	-0.649*** (-19.088)
credit constrained/South	-0.062*** (-6.889)	0.522*** (14.914)	-0.584*** (-15.368)
credit constrained/West	-0.078*** (-7.800)	0.685*** (20.758)	-0.763*** (-20.622)
business exp. (lag)	0.031*** (6.200)	-0.042*** (-4.667)	0.073*** (6.083)
employment (log)	-0.000 (-0.000)	-0.008 (-1.600)	0.008 (1.143)
Observations	19719	19719	19719
R-squared	0.067	0.173	0.167

Note: a - dependent variable equals 1 if a firm perceives lending conditions as accommodating (restrictive) and zero otherwise. b - dependent variable equals 0 or 1 for restrictive, 2 for normal and 3 for accommodating perceptions of surveyed firms. Sectoral and regional-time effects are not reported. No-need is used as the base category. *t*-statistics based on clustered standard errors at the firms level are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Statistical Appendix

Table A.1: Descriptive Statistics

Variable	label	Obs	Mean	Std.Dev.	Min	Max
perceptions of lending policy	kred_bankA	23201	1.802	0.602	1	3
accommodating perception	perc_accom	23201	0.102	0.302	0	1
restrictive perception	perc_rest	23201	0.300	0.458	0	1
employment	b	28227	135.210	550.385	1	13690
employment (log)	lnb	28227	3.567	1.424	0	9.524
business expectations	glpew6mA	26751	2.004	0.554	1	3
credit experience	kred_ver	28229	4.912	1.915	1	9
As	c_exp	28229	0.106	0.308	0	1
not as anticipated	c_loan	28229	0.052	0.221	0	1
worse terms	c_rcon	28229	0.030	0.171	0	1
lower volume	c_rvol	28229	0.009	0.092	0	1
Both	c_rboth	28229	0.013	0.113	0	1
no need	c_nneed	28229	0.703	0.457	0	1
credit constrained	c_nloan	28229	0.050	0.218	0	1
non-accept. terms	c_nacpt	28229	0.020	0.141	0	1
Rejection	c_rjct	28229	0.011	0.104	0	1
Discouraged	c_nchnc	28229	0.019	0.137	0	1
missing data on cr. experience	c_miss	28229	0.089	0.285	0	1
transition from normal to restrictive	t1nr	10855	0.095	0.293	0	1
transition from normal to accom.	t1na	10855	0.067	0.250	0	1
transition from accom. to normal	t1an	1724	0.400	0.490	0	1
transition from restrictive to normal	t1rn	5273	0.205	0.404	0	1
no transition, restr. remains restrictive	t1rr	5273	0.734	0.442	0	1
no transition, normal remains normal	t1nn	10855	0.768	0.422	0	1
no transition, accom. remains accom.	t1aa	1724	0.503	0.500	0	1
bank lending survey	blsemp	28227	2.905	0.184	2	3.3

Source: WIFO, ECB, OeNB, own computation.