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Dynamics of Access to Credit and Perceptions of Lending Policy: Evidence from a Firm Survey*

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Abstract

Loan supply and credit crunch have been a major concern since the financial crisis. We study access to loans and perceived bank lending policy using the Austrian Business Climate Survey for the period 2011 and 2014. Our results show that firms' perceptions of aggregate lending policy depend on their individual credit market experience. Different categories of negative experience, ranging from worse conditions to loan rejections, have strongly negative, persistent and surprisingly similar effects on lending policy perceptions. Moreover, firms are more likely to revise their perceptions during the period in which they need a loan. Our results are in line with theories on sticky information rational inattention, and pessimism bias when forming perceptions.

Keywords: Perception of lending policy, credit negotiations, formation of perceptions, sticky information, rational inattention, pessimism bias.
JEL Classification: G21, E51, D03.

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1. Introduction

Expectations of core economic variables have a far reaching impact on the effectiveness of economic and monetary policies. Correspondingly, this issue has recently been the subject of numerous theoretical and empirical contributions. Recent research results focus on the formation of expectations and show that an individuals' personal experience has a significant effect on his/her expectations about inflation, house prices and unemployment (Malmedier and Nagel, 2016; Kuchler and Zafar, 2015). As firms take decisions with potentially large real effects also on the whole economy we want to learn how they form their expectations.[1]

Since the great recession bank lending was one of the major concerns for policy makers. Therefore, it is important to understand how firms adjust their expectations of the banks' lending policy. In particular, firms may negotiate credit and may be more or less successful in obtaining a loan at the expected terms. We use the perceptions of lending policy as a proxy for firms' expectations whether they are likely to receive loans. To get more insights into the formation of firms' perceptions, we analyze how the firm's individual credit market experience, i.e. the result of a credit negotiation, affects a firm's views on the banks' lending policy.

We use unique information from the WIFO Business Climate Survey for the period 2011 – 2014. Firms are asked how they evaluate the lending policy of the banks in Austria (which we refer to as perceptions) and can chose between accommodating, normal and restrictive. In addition to their perception firms report their individual credit market experiences, i.e. whether they have had credit demand during the last three months and whether they were fully or partly successful in obtaining a loan or not.

The survey data show surprising dynamics in the activities of individual firms on the credit market behind relatively stable macroeconomic trends and lending policy perceptions. Our analysis provides three new insights into how firms make up their perceptions. First, firms form their perceptions based on their previous experience on the credit market. Second, they are more likely to update their perceptions when they demand loans. Third, negative individual experience including relatively bad credit

[1] See, for instance, Campello et al. (2010) on the effect of financial constraints on investment.

conditions (that is, credit conditions that are worse than expected) or credit rejections by the bank increases the probability that firms perceive lending policy as restrictive despite a generally expansive monetary policies. Moreover, these effects are strongly robust and persistent. Thus, our findings are in line with the ideas of sticky information, rational inattention and pessimism in the formation of perceptions. We contribute to this literature by demonstrating that the individual credit market experience matters when a firm forms its perception of aggregate policies.

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 test is presented in section 4. We conclude in section 5.

2. Literature Review

This paper is mainly related to two strands in the literature. First, our paper is related to the literature on the access to finance. So far, previous literature takes either the use of credit, perceived access or actual access serve as proxies of the access to finance. Hainz and Nabokin (2013) show that individual perceived access serves as a good proxy for the actual access to loans. Alternatively, firm surveys may be used to obtain the aggregate perception of the banks' lending policy in general (Fidrmuc and Hainz, 2013).

Second, there is a recent and growing literature on the formation of expectations. Expectations feature prominently in the macroeconomic literature as they exert an influence on economic decision making and real outcomes, such as investments or financial market activity (Gennaioli et al., 2015; Chiang et al., 2011, Malmedier and Nagel, 2011). Recently they started being investigated with microdata as well. Malmedier and Nagel (2016) show that inflation expectations reported in household surveys depend on the respondent's personal experience. They compare age cohorts of respondents using survey data that covers over 50 years. They show that inflation expectations depend on the respondent's age and are influenced by the experience a cohort; more recent experience has a stronger impact than experiences made earlier. Similarly, Kuchler and Zafar (2015) find that expectations about house prices in the U.S. are extrapolations of the recent development of house prices in the community of the respondent. They can also show that the distribution of expectations is wider if

volatility of house prices was higher in the past. Moreover, expectations about the country-wide unemployment rate increases if the respondent itself is unemployed. Kuhnen (2015) analyses how a subject's experience influences its perception in a laboratory experiments where subjects can invest and, if they invest in the risky asset, end up with either in a loss or a gain. She finds that the subjective beliefs about the risky asset are overly pessimistic if the subject has experienced a loss (and also belief errors are larger). These papers contradict the rational expectations hypothesis. Our results are in line with these findings suggesting that perceptions are formed using imperfect information and that firms exhibit a pessimism bias.

Other papers focus on the role of media coverage on expectations, with more coverage improving the accuracy of expectations (Easaw and Ghoshray, 2010). It is worth noting that also the tone of the news matters as badly toned news may reverse the effect (Lamla and Lein, 2014).

3. Testable Hypotheses

The literature has so far focused on how expectations are formed. We, in contrast, study how perceptions develop. Starting from a theoretical analysis with full information, there is a major difference between expectations and perceptions. When developing perceptions a rational agent under full information could perfectly observe the current situation. Thus, in the case of full information perceptions of a macroeconomic variable should be identical across agents. However, when forming expectations an agent has to decide what are the possible outcomes of the analyzed variable (the states of the world) as well as how likely is it that a particular state of the world arises. As a result, aggregate expectations will differ between homogenous individuals if they assign different probabilities to the states of the world. But the existing empirical evidence suggests that the formation of expectation is not consistent with the idea that a fully rational agent has full information. There are several reasons why agents may not behave as predicted by the model of rational expectations.

Coibion and Gorodnichenko (2012) summarize the models on the formation of expectations and highlight two major reasons why expectations are not rational. First, there is so-called 'sticky' information. Here the agents face some costs when they acquire or update new information on a variable. Therefore, the agents update their

information less likely than in a frictionless world (as in Reis, 2006; Mankiw and Reis, 2002). Second, 'noisy' information plays a role. In this case the agent gets only noisy signals about the underlying variable and the precision of the noise may or may not vary across agents (for instance, Sims, 2003).

We can apply these models to derive testable hypothesis about how agents form their perceptions if information is imperfect. If information is sticky, agents use new information, previous experience and public information to form perceptions. The weights of the three components depend on when they update their information and therefore may differ across individuals (Madeira and Zafar, 2015). Our data contain the firms' perceptions of the banks' lending policy and also the experience firms have made on the credit market in the three month prior to the survey with the possible experience categories ranging from credit at expected or worse terms, to non-acceptable terms, rejections by the bank or to discouragement of the firms (for more details see section 4.1.). Based on the arguments for sticky information, we formulate the following hypothesis.

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

Taking the argument of sticky information one step further, it is argued that firms show rational inattention. This means that firms pay more attention to the important variable but by intent remain ignorant about less important variables (Maćkowiak and Wiederholt, 2009). In the context of our paper, firms may follow what happens on the product market and on the credit market. The firm will pay more attention to the market which is more important. As long as a firm does not need credit, the focus should be on the product market. Once the firm starts to realize that it will need a loan, it will also pay attention to the credit market. In our survey firms report the results of credit negotiations during the last three months or state that they did not demand credit. Credit negotiations are likely to start after a process in which firms prepare for the negotiations with banks. The duration of the process varies between firms and could take several months. The talks between firm and bank will first focus on the chance of getting a loan. The firm receives imperfect signals about the readiness of the bank to grant a loan. The process ends either with an offer by the bank which also specifies the terms of the loan

or with a rejection. If we suppose that firms get new and informative signals when preparing for credit negotiations and during the negotiations, the idea of rational inattention leads to next hypothesis.

Hypothesis 2: Firms with credit demand adjust their perceptions with a higher probability in the period(s) before the credit negotiations are completed.

With noisy information firms update their perceptions regularly but their perceptions differ because the way they process the signals is not the same. Previous literature on the formation of expectations assumes that individuals update information rationally. In our case, we have quarterly data on firms' perceptions. Firms may use their current perceptions to predict what happens in the next period. During credit negotiations and, in particular, when the bank decides about the credit offer, the firm can compare its previous perceptions with the actual lending policy. If perceptions differ from bank behavior, the firm should revise its perceptions. When the bank makes a credit offer it also specifies the terms of the loan. If firms operate rationally with noisy information we would expect the following.

Hypothesis 3: Firms which receive a loan at the expected terms do not change their perception. However, firms which receive a loan but at worse than the expected terms revise their perception.

A similar setting 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 experiment participants have a possibility to invest into a risky stock and a safe bond. The returns to assets are random because they are either from a 'good' or from a 'bad' distribution differing in the chance to face a gain. The participants receive a calculation stating for each of the six rounds the Bayesian posterior probabilities of having a good distribution after observing a certain number of gains. Subjects are asked to assign a probability of having an asset with a good distribution. The individuals' beliefs differ from the given posterior probabilities as participants are less likely to report that they have a stock with a good distribution when they observe a loss. What is more, the subjective beliefs are also further away from the objective posterior probabilities when participants have experienced a loss. This can be

interpreted as investors are 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 in updating would imply the following.

Hypothesis 4: Firms with an unexpected experience at the credit market show a more negative perception of the banks' lending policy, i.e. firms that do not get a loan or get a loan but at worse terms more likely have negative perceptions.

4. Empirical Analysis

4.1. Data Description

We use data from the Wifo Business Climate Survey between November 2011 and February 2014. It provides a unique source of information on the perception of banks' lending behavior by Austrian manufacturing firms. We have about 7,000 observations in this data set (see descriptive statistics in statistical appendix, Table A.1). The surveys are available on a quarterly basis (for the months February, May, August and November).

The questions on bank lending policy have become increasingly popular in similar business surveys in the EU (Fidrmuc and Hainz, 2014, for Germany). Thus, the WIFO survey features the following question: "*How do you assess the readiness of banks to provide loans to firms?"* The possible answers include *accommodating*, *normal*, and *restrictive*.

Moreover, the WIFO survey includes also a question on the firm's credit market experience. Namely, the firms are asked: "*Did you sign a loan agreement in the last three months?*" The possible answers include several yes categories (*at expected terms, at expected volume but with worse terms, worse terms but expected volume, lower volume and worse terms*) and several no categories (*no need, non-acceptable terms, rejection by the bank, no realistic chance*). Thus, there are different categories in which firms end up without loans that range from rejections either by bank or by firm to discouraged firms. Our data set includes information on three distinct categories describing how the terms of a loan (that is, interest rate and amount, or both, are deviate from the previous expectations). For these three categories, although the firm gets a loan, its expectations are not fully met.

Moreover, the survey includes several other questions, among which especially the

firm's future situation is interesting for our analysis. In particular, the firms' prospects determine their creditworthiness and thereby access to credit and the firms' perceptions of the banks' lending behavior could be positively correlated with the firm's future business situation. Thus, the question on state of business is included as the main explanatory 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*".

Finally, we have altogether 10 consecutive quarterly surveys with anonymous but identified firms. This allows us to exploit the time dimension and to conduct panel analysis. The coverage of the data is also relatively good. Reflecting that we lose at least one survey for the computation of lagged variables, we can still use on average 5.1 (maximum 9) observations per firm.

Figures 1 and 2 present the development of the firm's credit market experience, the perception of the lending policy and the state of business. Surprisingly, the developments are somewhat opposing. On the one hand, Figure 1 shows that approximately 20 percent of firms signed a new credit contract in each of the surveyed periods, the majority of them at expected terms. On the other hand, the share of firms perceiving the lending policy as accommodating was only 7 to 10 percent. Similarly, in Figure 2 only 1 percent of loan applications have been rejected by the banks, actually less than the share of firms which did not accept the lending terms offered by the bank (approximately 2 percent). The share of discouraged firms is also relatively small at 3 percent. Despite of this, approximately one third of firms view the lending policy as restrictive. Finally, while the firms' credit market experience and perceptions of the lending policy have been surprisingly stable during the analyzed period, the expectations of the business situation underwent quite important cyclical changes.

The individual survey data show surprising dynamics of the firm's credit market experience behind relatively stable macroeconomic trends. On average, each firm had 0.9 loans. However, more than a half of the firms (60 percent) did not try to get loans during the analyzed periods. Firms with loans had on average 2.5 loans within the ten surveys in our dataset. Nearly all firms with loans had at least one period when they did not receive a loan despite they tried so. Similarly, nearly all firms with demand but no loans in a particular period had loans in a different period.

Moreover, we merge the business survey data with the main results of bank lending survey conducted jointly by the European Central Bank and Austrian National Bank. Selected banks in Austria are quarterly surveyed on lending conditions for new loans. We use the responses to the question on lending conditions, which is stated as: "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 information on the lending survey is available separately for small and medium enterprises (SMEs) and for large firms, although the differences are relatively small.[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). The individual results for the surveyed banks are not available. Nevertheless, we can use also a cross-section dimension for this indicator. Moreover, the results for this survey are available for a longer period (since the last quarter of 2004), which gives us some hints on developments before the business survey started to collect information on perceptions of the lending policy. From Figure 3 we take away three observations. Firstly, the lending conditions especially for the SMEs have been continuously tightened during the whole available period. Secondly, the lending conditions have been strongly tightened after the financial crisis, in particular, in 2008 (that is before the analyzed period). Finally, the lending conditions have been again tightened at the beginning of 2011, which falls directly to our analyzed period. Both periods of tightening the lending standards can influence the business surveys and perceptions of lending policy analyzed in our paper.

4.2. Empirical Strategy

We start our analysis with probit estimations. First, we estimate the probability that

[2] . The Bank lending survey defines SMEs as the firms with a turnover less than EUR 50 million. As far 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 data set is classified as SMEs.

firms perceive the lending policy, *lpol*, as accommodating, *lpol=alp*, or restrictive, *lpol=rlp*. The bank lending policy is a dummy variable that equals one if the firm reports that it perceives the lending policy as accommodating (restricitive) and zero otherwise.

Our main variable of interest is lagged experience in the credit market, *c*, that is, dummy variables for the eight indicators described above. The core explanatory variables include the expectations of business situation of the firm in the previous quarter as a proxy for creditworthiness, *b*, and contemporaneous employment (in logs) as a measure for firm size, *e*, as well as other controls **Z** (regional, time and sectoral effects). The estimation equation can be stated as

$$P(lpol_{it}=1)=\sum_{i=1}^{8}\alpha_i c_{it-1}+\beta_1 b_{it-1}+\beta_2 e_{it}+\mathbf{Z}_{it}\gamma+\varepsilon_{it} \quad \text{with } lpol = alp, rlp \qquad (4)$$

Our approach reflects that applying for a loan is a relatively long process. During the loan applications, the firms update their perceptions of bank lending policy. This process can take several months and the firms can possibly negotiate with several banks. While we do not have detailed information on the stepwise process of information acquisition of the firms, we show that the interactions with the banks represent an important source of information for loan applicants. For this purpose we look at the change in perceptions. In particular, we define a dummy variable *dpall*, which equals to one if the firm changes its perception and zero otherwise. Similarly, we study whether the firms improve or deteriorate their perceptions using analogous dummy variables, *dpplus* and *dpmin*, respectively. As the process of credit negotiations may take several months, we estimate the probit models for these variables using different time horizons,

$$P(dpol_{it}=1)=\sum_{i=1}^{8}\alpha_i c_{it}+\beta_1 b_{it-1}+\beta_2 e_{it}+\mathbf{Z}_{it}\gamma+\varepsilon_{it} \quad \text{with } dpol = dpall, dpplus, dpmin \qquad (5)$$

where all explanatory variables are defined as above.

4.3. Results

Perceived Bank Lending Policy

Table 1 reports the estimation results for the probit regression with accommodating

lending policy being the dependent variable. Lagged credit market experience is included either stepwise or all cases are included and then no need is taken as the reference category (last column). The results are strong and they show the important role of the individual experience of the firms on the formation of perceptions for the overall economy. Only banks' decision to offer credit at terms as expected comes with a higher probability (7 percentage points) that a firm will evaluate the lending policy as accommodating in the next period. Negative experience is clearly correlated with a worse perception of the lending policy. Worse credit terms come along with the probability of accommodating evaluation being lower by 4 percentage points, worse terms and lower volume already by 10 percentage points, non-acceptable terms by 14 percentage points. Actually, there are no firms that evaluate the lending policy as accommodating after their credit has recently been rejected by a bank, which means that this coefficient cannot be estimated. Discouraged firms evaluate the lending policy also less likely as accommodating (by -8 percentage points). In turn, firms without need are less likely (-2 percentage points) in the next quarter.

Moreover, the results show that firms with positive business expectations are 1.5 percentage points more likely to evaluate the lending policy as accommodating. Finally, large firms are less likely to view the lending policy as accommodating in general.

Table 2 shows that the marginal probability effects for the lending policy being perceived as restrictive are even higher than those for accommodating. In particular, credit rejections increase the average probability that the firm evaluates the lending policy as restrictive by 57 percentage points. The average marginal probability effects are only slightly lower if lending terms are worse in terms of costs and credit volume (53 percentage points). The decomposition of this impact into price and volume effect shows that the former (31 percentage points) is slightly more important than the loan volume (26 percentage points). As for accommodating lending policy, this overall impact is even larger than for firms which view the terms of the loan as non-acceptable (45 percentage points). By contrast, the marginal probability effects for firms having received loans at expected terms change the evaluation of the lending policy only marginally (-5 percentage points). Firms without demand are less likely to consider the lending policy as restrictive by 19 percentage points.

The comparison of probit results for accommodating and restrictive lending policy

perception shows that the latter coefficients are higher in absolute size. For example, firms which received loans but both at worse terms and lower volume assess the lending policy less likely (by 9.5 percentage points) as accommodating. At the same time, these firms are twice more likely (25.9 percentage points) to assess the lending policy as restrictive.

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 the personal experience influences the expectations of inflation, house prices and unemployment (Malmedier and Nagel, 2016; Kuchler and Zafar, 2015, Madeira and Zafar, 2015). Our results also support *hypothesis 4* that the way in which firms form their beliefs depends on their experience. In particular, we find that firms which get the loan at the expected terms are more likely to perceive the lending policy as accommodating. But firms that do not get a loan or not at the expected terms are more likely to report perceptions being restrictive and less likely to report perceptions being accommodating. This result is consistent with the notion of pessimism in updating beliefs which Kuhnen (2015) has demonstrated in a lab experiment.

4.4. Robustness Analysis

We conduct several additional tests to show the robustness of our results.

Firm Random Effect Probit Models

Unobservable factors including firm credibility and their self-evaluation can influence the impact of previous credit experience on lending policy evaluation. To deal with the omitted variable problems, we estimate (4) with random effect probit. Tables 3 and 4 show that worse terms, lower volume and discouragement have no longer a significant impact on firms' evaluation of lending policy as accommodating. However, the size of the remaining coefficients is higher. As before, only loans at expected terms are inducing a positive evaluation of the lending policy.

Moreover, all categories of credit experience remain significant when we consider the impact on lending policy evaluation as restrictive. As above, the inclusion of firm random effects increases the size of coefficients.

Ordered Probit

The main drawback for the previous results is that they treat different perception categories as distinct values. Moreover, they do not utilize the information on the full ordering over different categories. Finally, probit models cannot be estimated for a category which is a perfect predictor of some outcome, e.g. we can see that no firms that were rejected by banks evaluate the policy as accommodating.

Therefore, we present ordered probit estimation in Table 5. Note that while coefficients are estimated jointly for all categories, see column (I), the marginal probability effects have to be computed for all categories, columns (II) to (III).

The results are largely similar to the previous results. Only firms with loans at expected terms are less likely to evaluate the lending policy as restrictive (by 9.9 percentage points) and more likely to evaluate it as accommodating or normal (by 4.7 and 5.2 percentage points, respectively). In all remaining categories (again except no deman) coefficients have the opposite sign. Compared to probit and panel probit results, the marginal probability effects are smaller but still quite high: The rejections, for example, increase the probability of restrictive perception by 58 percentage points and lower the probability of accommodating perception by 27 percentage points. Compared to the previous results, the size of coefficient is more consistent with general expectations.

Lag Structure

The lending policy perceptions are likely to be based not only on the recent but on the longer-term experience on the credit market. Therefore, we include up to 4 lags of previous credit experience (see Table 6), which lowers the number of observations to less than a half of that for the full sample. Moreover, we present only the results for our preferred specification, which is ordered probit with all credit access categories. Finally, we present only estimated coefficients and not marginal probability effects.[3]

Positive experience on the credit market seems to have only little impact on formation

[3] The presentation of coefficients ordered probit is motivated especially by the possibility to present the robustness analysis in readable tables. The marginal probability effects are, if significant, similar to those presented in previous estimations. Detailed results are available upon request from authors.

of lending policy perceptions. The effects become actually insignificant if more lags are included.

By contrast, negative experience has strong impact on the perception. Worse credit terms resulting in either in an offer that was not taken by a firm or in a credit contract, have long-lasting significant effects which lower the perceptions of lending policy even after four quarters. As expected, coefficients become smaller and less significant with the time.

Compared to worse credit terms, loan rejections have a surprisingly short-living impact on firms' perceptions, which day out already after two quarters. Similarly, discouraged firms do not evaluate the lending policy differently from the remaining firms already after one quarter.

Subsample with No Recent Credit Experience

Alternatively to the inclusion of more lags, which both reduces the number of observations and increases the number of parameters, we can focus on firms which did not demand a loan at least for several periods and then tried to receive a credit (Table 9).[4] This allows seeing the impact of a particular experience on the credit market more clearly. However, the number of observations declines. Moreover, selection bias may be important in this analysis.

Despite these considerations, the estimations for subsamples without recent credit market experience confirm the previous findings. As before, only firms receiving loans at expected terms are more positive in the perceived lending policy. Similarly, rejections and worse credit terms (both regarding general terms and credit volume) lead to more negative perceptions.

Change of Perceived Bank Lending Policy

The descriptive statistics in Table 3 show that nearly a quarter of all firms with no demand change their perception of the lending policy. Mainly firms receiving a loan at

[4] In particular, in this robustness analysis we focus on firms withoutcredit demand for 1 up to 4 quarters before the credit experience, which is taken with an additional lag into estimation. Thus, the no credit experience is 2 to 6 quarters before the survey in time *t*.

expected terms change the perceptions of the lending policy, indeed, nearly one third of these firms revise their perceptions. The share is only slightly lower for firms receiving a loan but at worse terms either in volume or interest rate (approximately 20 percent of firms). In turn, only about 15 percent of the firms receiving either lower volume and higher interest rate or not receiving (or taking) a loan change the perception of the lending policy. The share is actually lowest for the firms that were rejected by the banks or discouraged (about 10 percent).

We provide regression results for two different reference periods in Table 9. In the first bloc, we report all changes without considering their direction in column (1), the easing, in column (2), and the tightening, in column (3), of lending policy relative to the last survey, i.e. there is one quarter between these two surveys. The columns (4) to (6) the particular changes are related to one survey earlier (i.e. two quarters).

The analysis of lending policy changes since the last survey yields several surprising results. Correspondingly to the descriptive statistics in previous table, we can see that firms that receive a loan are more likely to revise their perceptions than those without credit demand (which is the reference category). Similarly, firms that have negotiated but not signed a loan contract are less likely to change their perceptions. In general, firms with loans are more and firm without loans less likely to change their perceptions.

More insights can be derived from the analysis of direction how firms revise their perceptions. Firms with loans at the expected terms are more likely to improve and less likely to worsen their perceptions. The firms receiving loans but at worse terms regarding either the loan volume or the interest rate do not change much the perceptions of accommodating lending policy, except for those with both worse term and higher interest rates, which are less likely to perceive an easing of lending policy. At the same time, they are significantly more likely to see tightening of the lending policy. The firms without loans are significantly less likely to perceive an easing of lending policy, but the effects on the tightening perceptions remains insignificant.

Comparing with the last but one survey, we observe additional interesting features. Firms with loans, in general, do not change their perceptions significantly from firms without credit demand. This might indicate that positive loan decisions are completed already within one quarter. Only firms with higher interest rates are more likely to

perceive the change of lending policy as tightening but the marginal probability effect is smaller than that in the first bloc. The effect pattern of lending policy revisions for firms that did not get a loan remains similar though slightly lower like within one quarter. Interestingly the effects increase slightly for discouraged firms. As a result, it seems that unsuccessful loan negotiations are likely to extend over a relatively long period.

In sum, we find some support for *hypothesis 2* stating that firms with credit demand adjust their perceptions more likely. On the one hand, the results for firms with a loan are in line with this hypothesis. On the other hand, firms without a loan seem to adjust less likely than firms without credit demand. This would be consistent with the explanation that signal they obtained in the periods we study do not convey new information to them despite they made an effort to get new information. As we analyze only a period of up to six month this could also indicate that the process of conducting credit negotiations takes more time, especially for firms facing some problems to receive a loan.

Surprisingly, our results are not in line *hypothesis 3* predicting that firms which get a loan as expected should not change their perception whereas those with constraints on the terms of their loan do. According to our results, firms with loans at expected terms are most active in changing perceptions.

In further regressions (available upon request) we included also publicly available information on bank lending behavior. In particular, we use the bank lending survey conducted by the Austrian National Bank (OeNB) which is conducted as a part of the euro-wide surveys initiated by the ECB. The bank lending survey measures whether bank have tightened or eased its lending standards during the last quarter. Interestingly, public information remains insignificant in the regressions. However, general factors are already covered by time effects, although the variable remains insignificant if these are excluded. Another reason might be that public information on the banks' willingness to lend was ambiguous during our sample period. On the one hand, lose monetary policy by the ECB might suggest that banks have a lot of liquidity and a high willingness to lend. On the other hand, the bank lending survey (BLS) of the ECB shows that banks were slightly tightening their lending standards.

5. Conclusions

We review several theories on expectation formation and apply them to perceptions, reflecting that firms use similar imperfect information for forming both their expectations and perceptions, and. we test these hypotheses derived. We can track firms for a period of ten quarterly surveys and thus we can derive new insights into how perceptions are formed over time. We obtain three main results. First, firms form their perceptions based on their own previous credit market experience. Second, they update their perceptions if credit financing becomes important to them. Finally, when forming their perceptions firm are more optimistic if they get a loan at expected terms but are more pessimistic if they get a loan but terms are not as expected. Our results are thus consistent with the theory of sticky information, rational inattention and a pessimism bias when they form perceptions.

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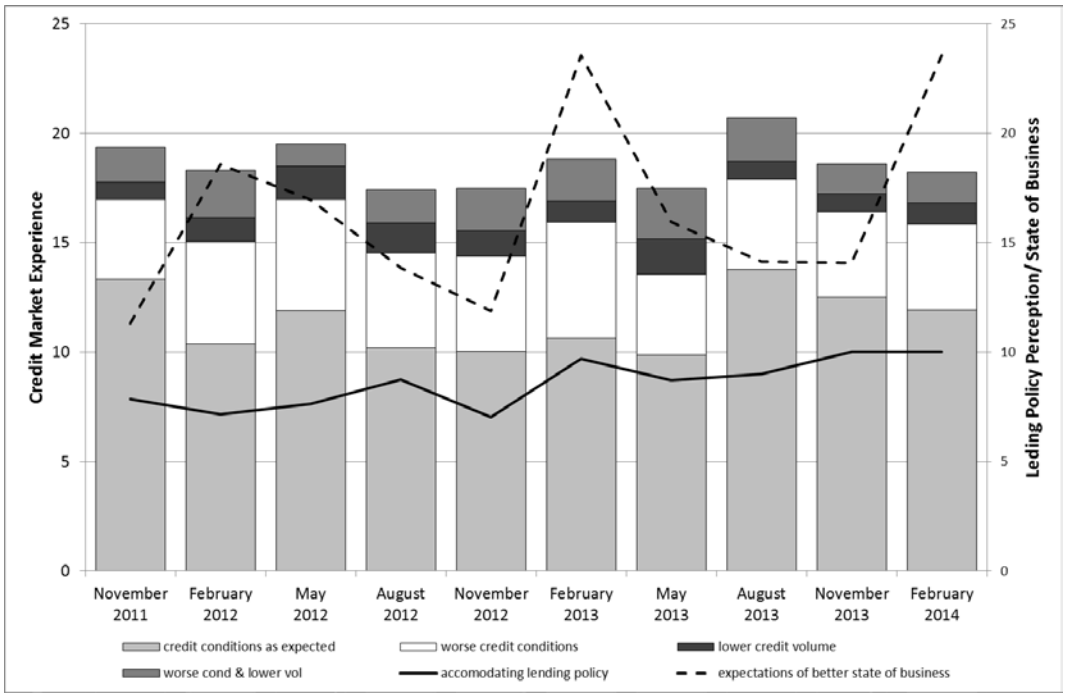
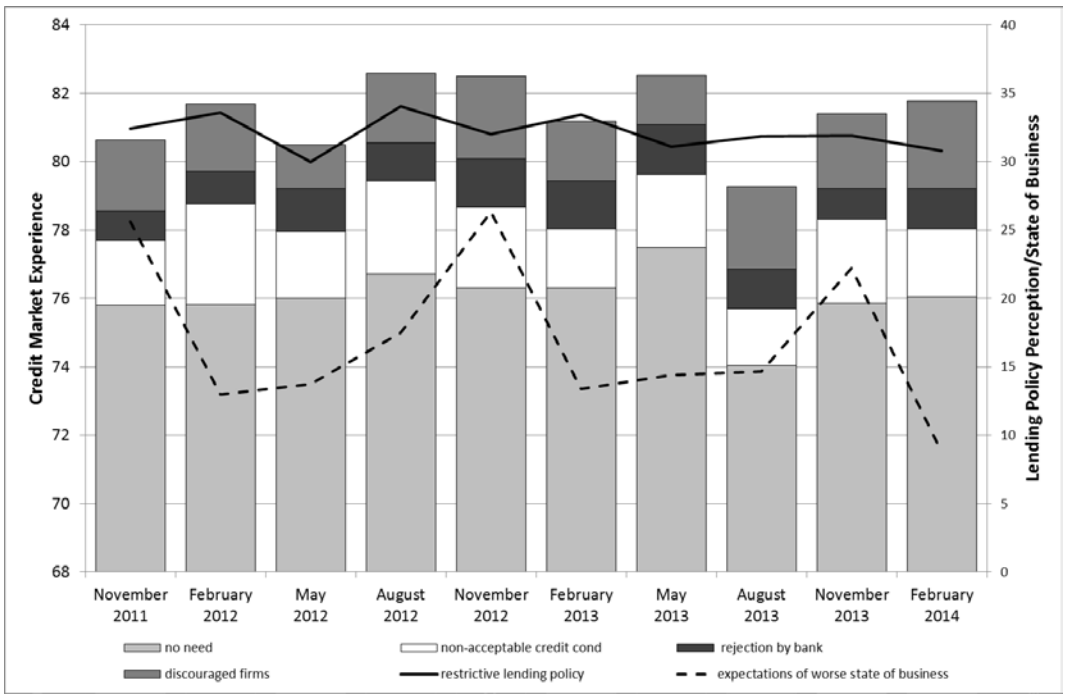
Figure 1: Having a Loan, Accommodating Lending Policy Perception, and Better Business Expectation



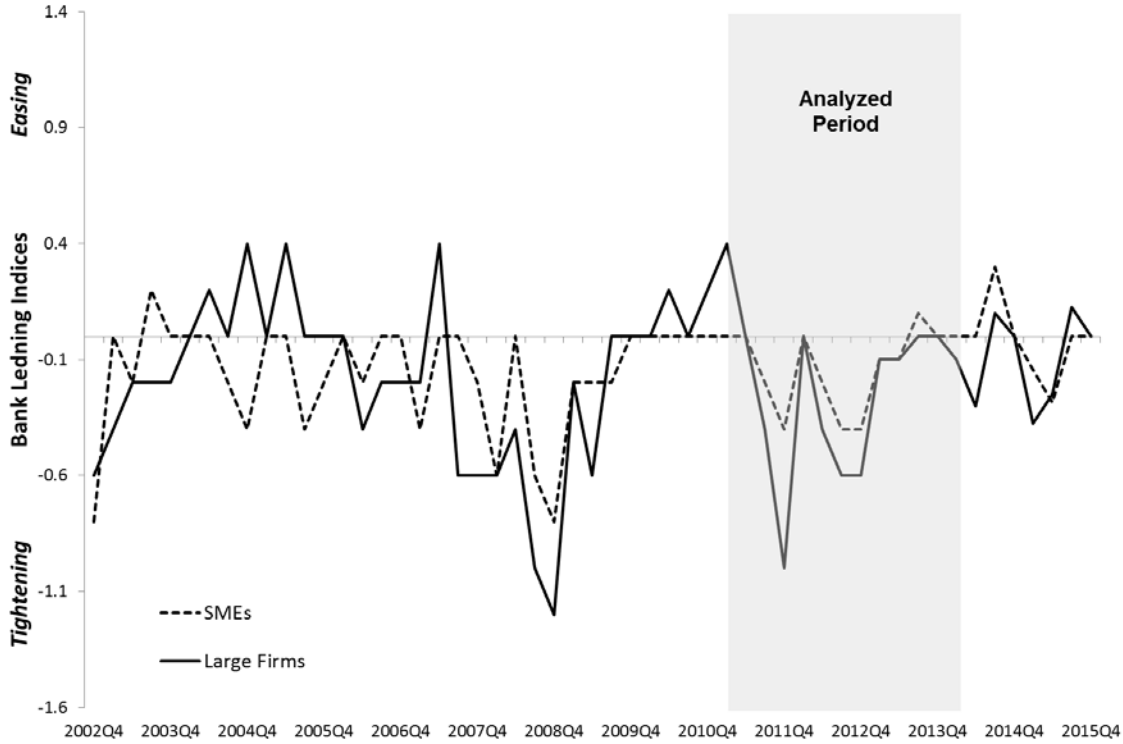
Source: WIFO, own computation.

Figure 2: Having No Loan, Restrictive Lending Policy Perception, and Worse Business Expectations



Source: WIFO, own computation.

Figure 3: Bank Lending Survey: SMEs and Large Firms



Source: ECB, OeNB, own computation.

Table 1: Determinants of Accommodating Lending Policy Perceptions, Average Marginal Probability Effects

	(I)		(II)		(III)		(IV)		(V)		(VI)		(VII)		(VIII)		(IX)		(X)	
business exp. (lag)	0.015	***	0.015	***	0.016	***	0.016	***	0.015	***	0.015	***	0.016	***	0.016	***	0.014	***	0.014	***
	(0.005)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)	
employment (log)	-0.005	**	-0.004	**	-0.005	**	-0.005	**	-0.005	**	-0.005	**	-0.005	**	-0.005	**	-0.006	***	-0.006	***
	(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)	
as expected (lag)	0.071	***															0.066	***	0.066	***
	(0.007)																(0.007)		(0.007)	
worse cond (lag)			-0.042	**													-0.034	*	-0.034	*
			(0.018)														(0.018)		(0.018)	
lower volume (lag)					0.034												0.038		0.038	
					(0.026)												(0.026)		(0.026)	
both (lag)							-0.095	**									-0.086	**	-0.086	**
							(0.038)										(0.038)		(0.038)	
no need (lag)									-0.020	***							REF		REF	
									(0.006)											
non-accept. cond. (lag)											-0.138	***					-0.129	***	-0.128	***
											(0.048)						(0.047)		(0.047)	
rejection (lag)													NE				NE		NE	
discouraged (lag)															-0.076	***	-0.068	**	-0.067	**
															(0.029)		(0.028)		(0.028)	
bank lending survey																			-0.010	
																			(0.034)	
No of obs	8314		8314		8314		8314		8314		8314		8229		8314		8229		8215	

Note: Regional, time, and sectoral effects are not reported. Robust standard errors in parentheses. Rejection predicts failure perfectly. NE – not estimated. REF – reference category.

Table 2: Determinants of Restrictive Lending Policy Perceptions, Average Marginal Probability Effects

	(I)		(II)		(III)		(IV)		(V)		(VI)		(VII)		(VIII)		(IX)		(X)	
business exp. (lag)	-0.031	***	-0.028	***	-0.033	***	-0.032	***	-0.031	***	-0.029	***	-0.031	***	-0.030	***	-0.024	***	-0.024	***
	(0.009)		(0.009)		(0.009)		(0.009)		(0.009)		(0.009)		(0.009)		(0.009)		(0.008)		(0.008)	
employment (log)	-0.011	***	-0.014	***	-0.011	***	-0.012	***	-0.014	***	-0.010	***	-0.010	***	-0.010	***	-0.008	**	-0.006	**
	(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)	
as expected (lag)	-0.051	***															0.016		0.017	
	(0.016)																(0.015)		(0.015)	
worse cond (lag)			0.312	***													0.327	***	0.327	***
			(0.023)														(0.021)		(0.021)	
lower volume (lag)					0.259	***											0.285	***	0.286	***
					(0.047)												(0.042)		(0.042)	
both (lag)							0.526	***									0.529	***	0.528	***
							(0.041)										(0.037)		(0.037)	
no need (lag)									-0.192	***							REF			
									(0.010)											
non-accept. cond. (lag)											0.453	***					0.460	***	0.460	***
											(0.036)						(0.033)		(0.033)	
rejection (lag)													0.566	***			0.565	***	0.566	***
													(0.055)				(0.050)		(0.050)	
discouraged (lag)															0.368	***	0.380	***	0.380	***
															(0.034)		(0.030)		(0.030)	
bank lend. survey (lag)																			0.054	
																			(0.052)	
No of obs	8314		8314		8314		8314		8314		8314		8314		8314		8314		8300	

Note: Regional, time, and sectoral effects are not reported. Robust standard errors in parentheses. REF – reference category.

Table 3: Determinants of Accommodating Lending Policy Perceptions, Random Effects Probit, Av. Marginal Probability Effects

	(I)		(II)		(III)		(IV)		(V)		(VI)		(VII)		(VIII)		(IX)		(X)	
business exp. (lag)	0.102	*	0.100	*	0.103	*	0.103	*	0.103	*	0.102	*	0.102	*	0.103	*	0.101	*	0.105	*
	(0.057)		(0.058)		(0.058)		(0.058)		(0.058)		(0.058)		(0.058)		(0.058)		(0.057)		(0.058)	
employment (log)	-0.078	**	-0.075	**	-0.074	**	-0.075	**	-0.076	**	-0.077	**	-0.076	**	-0.077	**	-0.081	**	-0.079	**
	(0.035)		(0.036)		(0.036)		(0.036)		(0.036)		(0.036)		(0.036)		(0.036)		(0.035)		(0.035)	
as expected (lag)	0.477	***															0.435	***	0.381	**
	(0.087)																(0.089)		(0.168)	
worse cond (lag)			-0.302														-0.219		-0.274	
			(0.199)														(0.197)		(0.243)	
lower volume (lag)					0.346												0.333		0.278	
					(0.295)												(0.294)		(0.326)	
both (lag)							-0.725	*									0.746	*	-0.802	*
							(0.397)										(0.394)		(0.417)	
no need (lag)									-0.175	**							REF		-0.062	
									(0.075)										(0.152)	
non-accept. cond. (lag)											-1.283	***					-1.276	***	-1.329	***
											(0.491)						(0.485)		(0.503)	
rejection (lag)													NE				NE		NE	
discouraged (lag)															-0.460		-0.513		-0.569	
															(0.331)		(0.331)		(0.361)	
bank lending survey																			-0.033	
																			(0.381)	
No of obs	8314		8314		8314		8314		8314		8314		8229		8314		8229		8215	

Note: Regional, time, and sectoral effects are not reported. Robust standard errors in parentheses. Rejection predicts failure perfectly. NE- not estimated. REF – reference category.

Table 4: Determinants of Restrictive Lending Policy Perceptions, Random Effects Probit, Average Marginal Probability Effects

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
business exp. (lag)	-0.028	-0.031	-0.030	-0.034	-0.029	-0.023	-0.030	-0.028	-0.036	-0.035
	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)
employment (log)	-0.065 *	-0.069 *	-0.066 *	-0.066 *	-0.071 *	-0.065 *	-0.067 *	-0.066 *	-0.056	-0.051
	(0.038)	(0.037)	(0.038)	(0.037)	(0.036)	(0.037)	(0.037)	(0.037)	(0.034)	(0.034)
as expected (lag)	-0.219 ***								0.047	0.049
	(0.081)								(0.815)	(0.082)
worse cond (lag)		0.573 ***							0.863 ***	0.863 ***
		(0.118)							(0.119)	(0.119)
lower volume (lag)			0.538 **						0.908 ***	0.911 ***
			(0.223)						(0.220)	(0.220)
both (lag)				1.221 ***					1.610 ***	1.609 ***
				(0.203)					(0.200)	(0.200)
no need (lag)					-0.424 ***				REF	
					(0.062)					
non-accept. cond. (lag)						0.880 ***			1.200 ***	1.200 ***
						(0.179)			(0.177)	(0.177)
rejection (lag)							0.995 ***		1.507 ***	1.506 ***
							(0.265)		(0.264)	(0.264)
discouraged (lag)								0.522 ***	0.958 ***	0.955 ***
								(0.188)	(0.036)	(0.186)
bank lending survey										0.143
										(0.275)
No of obs	8314	8314	8314	8314	8314	8314	8314	8314	8314	8300

Note: Regional, time, and sectoral effects are not reported. Robust standard errors in parentheses. REF – reference category.

Table 5: Determinants of Lending Policy Perceptions, Ordered Probit

	estimated coefficients				average marginal probability effects											
					restrictive LP				normal LP				accommodating LP			
specification	(1)		(2)		(1)		(2)		(1)		(2)		(1)		(2)	
business exp. (lag)	0.099	***	0.099	***	0.031	***	-0.031	***	0.016	***	0.016	***	0.015	***	0.015	***
	(0.027)		(0.027)		(0.003)		(0.008)		(0.004)		(0.004)		(0.004)		(0.004)	
employment (log)	0.001		-0.002		0.000		0.001		0.000		0.000		0.000		0.000	
	(0.010)		(0.011)		(0.003)		(0.003)		(0.002)		(0.002)		(0.001)		(0.002)	
as expected (lag)	0.213	***	0.214	***	-0.067	***	-0.067	***	0.035	***	0.036	***	0.032	***	0.032	***
	(0.046)		(0.046)		(0.014)		(0.015)		(0.008)		(0.008)		(0.007)		(0.007)	
worse cond (lag)	-0.933	***	-0.931	***	0.293	***	0.292	***	-0.155	***	-0.155	***	-0.138	***	-0.138	***
	(0.084)		(0.084)		(0.0254)		(0.025)		(0.014)		(0.014)		(0.013)		(0.013)	
lower volume (lag)	-0.614	***	-0.613	***	0.192	***	0.193	***	-0.102	***	-0.102	***	-0.091	***	-0.091	***
	(0.181)		(0.181)		(0.057)		(0.057)		(0.030)		(0.030)		(0.027)		(0.027)	
both (lag)	-1.679	***	-1.676	***	0.527	***	0.526	***	-0.278	***	-0.278	***	-0.248	***	-0.248	***
	(0.181)		(0.153)		(0.046)		(0.046)		(0.025)		(0.025)		(0.023)		(0.023)	
non-accept. cond. (lag)	-1.535	***	-1.533	***	0.608	***	0.481	***	-0.254	***	-0.255	***	-0.227	***	-0.227	***
	(0.127)		(0.127)		(0.057)		(0.038)		(0.021)		(0.021)		(0.020)		(0.020)	
rejection (lag)	-1.937	***	-1.937	***	0.608	***	0.608	***	-0.321	***	-0.322	***	-0.287	***	-0.286	***
	(0.184)		(0.184)		(0.057)		(0.057)		(0.020)		(0.031)		(0.028)		(0.028)	
discouraged (lag)	-1.198	***	-1.197	***	0.376	***	0.376	***	-0.198	***	-0.199	***	-0.177	***	-0.177	***
	(0.121)		(0.120)		(0.037)		(0.037)		(0.020)		(0.020)		(0.018)		(0.018)	
bank lending survey (lag)			-0.151				0.048				-0.025				-0.022	
			(0.161)				(0.051)				(0.027)				(0.024)	
No of obs	7050		7039													
Log pseudolikelihood	-5665.5		-5656.8													
Pseudo R2	0.0878		0.0877													

Note: Regional, time, and sectoral effects are not reported. Robust standard errors in parentheses. No-need is taken as the reference category.

Table 6: Determinants of Lending Policy Perceptions, Ordered Probit, Lag Structure

	as expected		worse cond.		lower volume	both		non-accept. cond		rejection		discou-raged	
1st Lag	0.339	***	-0.611	***	-0.187	-1.115	***	-0.810	***	-0.945	***	-0.682	***
	(0.077)		(0.128)		(0.309)	(0.255)		(0.219)		(0.261)		(0.204)	
2nd Lag	0.202	**	-0.293	**	-0.090	-0.718	***	-0.872	***	-0.830	**	-0.107	
	(0.079)		(0.133)		(0.306)	(0.242)		(0.238)		(0.357)		(0.214)	
3rd Lag	0.050		-0.312	**	-0.051	-0.885	***	-0.710	***	-0.446		-0.509	**
	(0.080)		(0.121)		(0.268)	(0.290)		(0.205)		(0.297)		(0.223)	
4th Lag	0.059		-0.263	**	-0.128	-0.780	***	-0.575	***	-0.439		-0.471	**
	(0.077)		(0.122)		(0.221)	(0.278)		(0.194)		(0.259)	*	(0.211)	
No of obs	3483												

Note: Core variables, regional, time, and sectoral effects are not reported. Robust standard errors in parentheses. Only estimated coefficients are reported (no marginal probability effects). No-need is taken as the reference category.

Table 7: Determinants of Lending Policy Perceptions, Subsample of Firms with No Recent Credit Experience

	basic		no credit need during a previous period of								
	specification		1 quarter		2 quarters		3 quarters		4 quarters		
business exp. (lag)	0.099	***	0.119	***	0.105	**	0.074		0.067		
	(0.027)		(0.37)		(0.045)		(0.055)		(0.067)		
employment (log)	0.001		0.010		0.013		0.022		0.018		
	(0.010)		(0.014)		(0.017)		(0.019)		(0.023)		
as expected (lag)	0.213	***	0.272	***	0.405	***	0.407	***	0.435	**	
	(0.046)		(0.082)		(0.114)		(0.156)		(0.201)		
worse cond (lag)	-0.933	***	-0.736	***	-0.607	**	-0.810	***	-1.396	***	
	(0.084)		(0.183)		(0.254)		(0.303)		(0.509)		
lower volume (lag)	-0.614	***	-0.146		-0.339		-0.375		-0.900		
	(0.181)		(0.375)		(0.432)		(0.441)		(0.901)		
both (lag)	-1.679	***	-1.349	***	-1.346	***	-1.375	***	-1.019	**	
	(0.181)		(0.334)		(0.486)		(0.481)		(0.539)		
non-accept. cond. (lag)	-1.535	***	-1.109	***	-1.113	***	-0.884	**	-1.303	**	
	(0.127)		(0.258)		(0.387)		(0.433)		(0.621)		
rejection (lag)	-1.937	***	-5.828	***	-5.631	***	-5.484	***	-5.517	***	
	(0.184)		(0.084)		(0.121)		(0.181)		(0.265)		
discouraged (lag)	-1.198	***	-0.726	***	-0.546		-0.023		-0.910		
	(0.121)		(0.265)		(0.346)		(0.441)		(0.760)		
No of obs	7050		3988		2796		2018		1465		

Note: Regional, time, and sectoral effects are not reported. Only estimated coefficients are reported (no marginal probability effects). Robust standard errors in parentheses. No-need is taken as the reference category.

Table 8: Change of Perceived Bank Lending Policy

A. Changes vis-à-vis one quarter

	no need	as expected	lower volume	worse terms	both vol./ cond.	non-accept. cond.	rejected by bank	discouraged
easing	580	201	36	8	3	8	1	11
tightening	597	88	68	17	21	14	8	16
no change	4100	623	252	59	123	142	97	138
share of changes	22.3%	31.7%	21.3%	22.4%	16.3%	13.4%	8.5%	10.4%

B. Changes vis-à-vis two quarters

	no need	as expected	lower volume	worse terms	both vol./ cond.	non-accept. cond.	rejected by bank	discouraged
easing	493	101	32	12	5	7	3	7
tightening	458	85	41	4	17	9	5	12
no change	3156	503	195	43	79	106	73	104
share of changes	23.2%	14.5%	17.4%	8.5%	17.7%	7.8%	6.4%	10.3%

Table 9: Determinants of Changes of the Lending Policy Perceptions, Probit Models, Average Marginal Probability Effects

	changes vis-à-vis one quarter						changes vis-à-vis two quarters					
	all changes		**easing**		**tightening**		**all changes**		**easing**		**tightening**	
business expectations (lag)	0.006		-0.001		0.007		-0.004		0.005		-0.009	
	(0.009)		(0.007)		(0.007)		(0.011)		(0.008)		(0.008)	
employment (log)	-0.007	*	-0.002		-0.005	*	-0.009	**	-0.004		-0.004	
	(0.004)		(0.003)		(0.003)		(0.004)		(0.003)		(0.003)	
as expected	0.091	***	0.094	***	-0.023	*	0.029		0.013		0.015	
	(0.015)		(0.011)		(0.013)		(0.018)		(0.014)		(0.013)	
worse cond	0.073	***	-0.004		0.069	***	0.034		-0.012		0.043	**
	(0.024)		(0.019)		(0.017)		(0.028)		(0.023)		(0.020)	
lower volume	0.091	*	-0.033		0.097	***	0.033		0.069	*	-0.067	
	(0.047)		(0.041)		(0.032)		(0.058)		(0.040)		(0.054)	
both	-0.058		-0.155	***	0.033		-0.023		-0.090	**	0.042	
	(0.039)		(0.047)		(0.026)		(0.045)		(0.042)		(0.030)	
non-accept. cond.	-0.134	***	-0.130	***	-0.030		-0.111	**	-0.082	**	-0.035	
	(0.043)		(0.042)		(0.030)		(0.047)		(0.040)		(0.034)	
rejection	-0.189	***	-0.211	***	-0.045		-0.164	***	-0.120	**	-0.056	
	(0.057)		(0.074)		(0.038)		(0.061)		(0.053)		(0.044)	
discouraged	-0.093	**	-0.082	**	-0.021		-0.105	**	-0.099	**	-0.015	
	(0.038)		(0.033)		(0.027)		(0.044)		(0.039)		(0.032)	
No of obs	6496		6496		6496		5052		5052		5052	
Log pseudolikelihood	-3493.17		-2303.09		-2305.62		-2719.78		-1827.98		-1773.75	

Note: Regional, time, and sectoral effects are not reported. Robust standard errors in parentheses. No-need is taken as the reference category. Marginal probability effects are evaluated at the mean of independent variables.

Statistical Appendix

Table A.1: Descriptive Statistics

Variable	label	Obs	Mean	Std.Dev.	Min	Max
perceptions of lending policy	kred_bankA	10857	1.765	0.593	1	3
accommodating perception	perc_accom	10857	0.321	0.467	0	1
restrictive restrictive	perc_rest	10857	0.086	0.280	0	1
perceptions of lending pol. (lag)	Lkred_bankA	7901	1.765	0.584	1	3
change of perceptions within 1 quarter	Dkred_bankA	7334	0.004	0.511	-2	2
change of perceptions within 2 quarters	D2kred_bankA	5672	0.006	0.507	-2	2
employment	b	13153	138.445	556.113	0	12,750
employment (log)	lnb	13143	3.599	1.433	0	9.453
business expectations	glpew6mA	11889	2.000	0.578	1	3
business expectations (lag)	Lglpew6mA	9427	1.975	0.573	1	3
credit experience	kred_ver	13180	4.847	1.899	1	9
as expected	c_exp	13180	0.105	0.307	0	1
worse cond	c_rcon	13180	0.039	0.195	0	1
lower volume	c_rvol	13180	0.010	0.101	0	1
both	c_rboth	13180	0.016	0.125	0	1
no need	c_nneed	13180	0.698	0.459	0	1
non-accept. cond.	c_nacpt	13180	0.020	0.140	0	1
rejection	c_rjct	13180	0.011	0.103	0	1
discouraged	c_nchnc	13180	0.019	0.135	0	1
missing data on cr. experience	c_miss	13180	0.081	0.274	0	1
as expected (lag)	Lc_exp	9364	0.108	0.310	0	1
worse cond (lag)	Lc_rcon	9364	0.040	0.197	0	1
lower volume (lag)	Lc_rvol	9364	0.010	0.098	0	1
both (lag)	Lc_rboth	9364	0.016	0.127	0	1
non-accept. cond. (lag)	Lc_nacpt	9364	0.020	0.140	0	1
rejection (lag)	Lc_rjct	9364	0.010	0.101	0	1
discouraged (lag)	Lc_nchnc	9364	0.018	0.133	0	1
bank lending survey	blsemp	13153	2.838	0.206	2.0	3.1

Source: WIFO, ECB, OeNB, own computation.