What were they thinking?
Firms' expectations on the availability of bank loans

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Abstract

Using a large set of firm-level survey data from the euro area, we analyse how firms use their information to form expectations on the availability of bank finance. Our results suggest that firms update what otherwise look like adaptive expectations on the basis of the latest information in their information set. As in the previous literature, the hypothesis that expectations fulfil the (orthogonality) conditions of the rational expectations hypothesis is rejected by the data. We find evidence that this is not only due to information imperfections but also to some misspecification of the expectations' model that firms are using. In addition, we find some evidence that companies that are less "informed" on bank financing (e.g. they have not used it recently) tend to do worse at forecasting its availability next period. To test how policy announcements may affect expectations, we concentrate on the case study of the announcement of the European Central Bank's Outright Monetary Transactions Program (OMT). We find some evidence of forward looking expectations. In particular, the forecasts shortly after the OMT announcement of at least the larger firms and "informed" firms were more upbeat than it would have been expected at the time.

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1. Introduction

The analysis of expectations has received fresh impetus since the last financial crisis. Overreaction of expectations and miscalculation of risk, are believed to have played a significant role in the business cycle both in the period of rapid growth and, thereafter, in the recession and recovery (Gennaioli and Schleifer, 2018). Empirical work on expectations has also benefited by the advent of survey data, important for micro empirical studies. The emphasis has been primarily on financial markets and households, rather than on non-financial companies, mainly because of the relative unavailability of data for the latter (Pesaran and Weale, 2006 and Coibion et al., 2018). At least in theory, however, the expectations of non-financial companies are just as important – if not more so – for the propagation of shocks and policies to the economy, for example in decisions of companies to invest or hire, postpone and revise production plans and build inventories. Expectations about the external financial conditions, in particular, are important for decisions on the timing of investment and production and hence also on the transmission of financial shocks and monetary policy to the real economy.

In what follows, we use new survey data to explore how non-financial companies form their expectations on the availability of bank finance. The dataset provides only qualitative information, but has four important features that make it particularly useful for the study of expectations. First, the expectations on the availability of bank finance are in many cases more relevant financial variable than the more commonly analysed expectations of market interest rate or inflation, particularly when it comes to small and medium enterprises (SMEs). Second, the survey provides reasonably good (qualitative) proxies of the idiosyncratic information of each respondent at the time of his/her reporting of forecasts. As it will become clear below, the idiosyncratic information of companies is particularly important when testing expectations models with incomplete information. Third, the survey provides information on how relevant banking finance is to the company, which is potentially an important factor determining the effort companies place in collecting information and in forming expectations ("inattention"). Fourth, the dataset has a broad coverage of non-financial companies in Europe over a time span of 10 years (2009-2018). In particular, it covers all company size classes, down to companies with one employee, in different non-financial sectors. The motivation for looking specifically at the expectations of SMEs is that they play a very

significant role in employment and output creation. The multi-country data, allow us to better control for the country specific business cycle.

The paper contributes to the economic literature of expectations in the following ways.

First, the paper delivers new evidence about the expectations formation of non-financial companies. Differently from many studies that test expectation mechanisms by means of agents' beliefs about macro variables such as inflation or GDP, we explore the company's perceptions of external financing conditions as they apply to the specific company – a variable that impacts directly the firm's business conditions and determines a number of its decisions.

Second, the estimated expectation model suggests that non-financial companies do not follow one of the simple extrapolative rules (such as an autoregressive model) and seem to update their expectations on the basis of the latest information in their information set.

Third, as in the previous literature, the hypothesis that expectations fulfil the (orthogonality) conditions of the rational expectations hypothesis is rejected by the data. That is, we find systematic correlations between, on the one hand, past information and some structural firm characteristics and, on the other hand, the expectation error, even after controlling for country and business cycle effects. Interestingly, we also find evidence that the expectation error is correlated with information that we know companies had in their information set at the time of forming their expectations and had also identified as relevant for the availability of external finance in the past. This finding indicates that deviations from the rational expectations hypothesis (REH) are unlikely to be only due to information imperfections (e.g sticky information or inattentiveness to news), but are possibly also due to some misspecification of the expectations' model that firms are using.

Fourth, we find some evidence that companies that have not used bank finance recently tend to do worse at forecasting its availability next period. This provides support to the idea that proximity/familiarity with the banking system provides to companies insights and information that are useful for forecasting future financial conditions. While this points to asymmetric or incomplete information, we cannot confirm that there is rational inattention also involved.

Finally, we explore whether the expectations of non-financial companies concerning the future availability of bank finance changed following the policy announcements of the

European Central Bank's Outright Monetary Transactions Program in summer of 2012. The question is clearly of relevance to the wider issue of how and how fast communication on policies may affect the decisions of businesses. We find some evidence of forward looking expectations. Following the OMT announcement, firms revised positively their expectations, in particular larger firms and "informed" firms, i.e. the ones that were in close contact and had active dealings with banks during the period of the policy announcements.

The structure of the paper is as follows. Section 2 overviews the main issues of the relevant literature while section 3 describes our dataset. Section 4 introduces the basic empirical models of expectations and presents the main econometric results. In section 5 we test the rational expectations hypothesis while in section 6 we explore the role of asymmetric information and inattention using a suggested new metric on the "inaccuracy" of expectations. Finally, in section 7 we discuss some possible way forward on the important issue of the effect of policy announcements on expectations - in this case, the ECB policy announcement on the Outright Monetary Transactions-. Section 8 concludes.

2. From heuristics to rational expectations and back

The analysis of the expectation formation of companies and households (in short, the "forecasters") has a very long tradition in economics. Broadly speaking and no matter what the variables of interest were, one of the main underlying issues in this literature has always been whether the expectation formation is "model based" and "forward looking" or, instead, more based on some type of "heuristics" and "backward looking", e.g. based on statistical regularities observed in the past. A policy related question has been to what extent and how fast forecasts of companies and households react to the arrival of news, policy announcements and business shocks.

For the most part, the early literature concerned forecasts by financial market participants and households, mainly of macroeconomic variables such as inflation, interest rates or output growth. The discussion of the last 10 years on the transmission of "unconventional" monetary policy measures to real activity and/or the advent of new survey data has brought attention also to the expectations of non-financial businesses (Bachmann and Elstner, 2015; Boneva et

al., 2016; Massenot and Pettinicchi, 2018; Coibion et al, 2018).[1] As in the earlier literature, one important focus has been on the expectations of firms of macroeconomic variables, but subject to data availability, expectations of variables more directly relevant to the credit channel have also been examined (Dunkelberg and Scott, 2009; Ferrando et al, 2019). As Dunkelberg and Scott point out, the credit channel is particularly important for SMEs that rely heavily on bank loans. The way these enterprises form their expectations may well differ from larger institutions or from professional forecasters.

In the early analysis, empirical models of expectations clustered around two main streams. The first was based on extrapolative models originating, among others, from the work of Cagan (1956) and Nerlove (1983). In the simplest form, extrapolative models assume that the most readily available and least costly information about a future value of a variable (in levels or in growth rates) is to be found in its current and past values. Variations of the extrapolative model may also include a long term "normal" or steady state value that may "anchor" expectations. The expected long term steady state may, in turn, be time-varying and may be modelled on the basis of other information available at the time forecasts are formed. This is then the "forward looking" part. In adaptive expectations, on the other hand, the relevant forecasters are thought to revise their forecast also on the basis of the current (or past) forecast errors, which introduces another "backward looking" element. Thus, in a more general form, forecasts in an empirical extrapolative model are a function of the current (and previous) observations of the respective variable, previously held forecasts (or forecast errors) and possibly other current and past information considered relevant for the long term equilibrium.

A second stream of the analysis of expectations made reference to the theoretical framework of the rational expectation hypothesis (REH), as introduced by Muth (1961). Expectations are formed rationally if the subjective forecast of the forecaster is equal to the mathematical expectation of the relevant variable, conditional on the set of information relevant for the forecast. For most intends and purposes, this is understood to mean that the forecasters form their expectations using a model that is close to the true structure of the economy (the true data generating mechanism). The implication is that rationally formed expectations should be unbiased predictors of the relevant variables and the ex post forecast errors should be orthogonal to information available at the time of forming the forecasts. In this sense, rational

[1] A parallel and closely related literature has looked at companies' own plans, for example, on investment (Schankerman, 2002, Dave, 2011).

expectations are forward looking. Though the orthogonality condition of the REH has been challenged in empirical literature, the hypothesis that forecasters form unbiased forecasts using all disposable information efficiently has had deep impact on empirical research and macro-economic modelling.

An area of much subsequent analysis of expectations has focused on the information forecasters use. Timely information is thought to be costly and difficult to collect and interpret, more so for some forecasters than for others. Thus, even if forecasters use efficiently the information they have, it could still be the case that at least some forecasters react slowly to news, as they become aware of the relevant information with a delay. Moreover, if the information they receive is noisy, they may discount its importance hedging their bets, what may result again to aggregate expectations being regressive (Mankiw & Reis, 2002; Coibion and Gorodnichenko, 2015). As a result, following a shock, the mean forecast of a variable will be more mute compared to the actual response of the underlying variable. "Sticky" information may also be the outcome of rational inattention, in the sense that forecasters may choose to invest less in the acquisition of information if it is not very relevant for their purposes and a cost-benefit analysis does not justify more attention and costs. (Sims, 2003; Cobion et, 2018).

Asymmetric and incomplete information may not be the only reason why the REH orthogonality conditions may be rejected. A different but related reason may be limits in the decision maker's capability of processing all the information needed for rational expectations. In other words, even if economic decision makers had free and full access to the complete information on the current state of the world, their forecast may still deviate from what one would expect under the REH because their inference models are not optimal in the specific context. As Evans & Honkapohja (2001) note, most agents may lack sophistication to form expectations rationally because this requires agents to possess too much knowledge about the true structure and probability distribution of the economy that not even econometricians succeed to estimate perfectly. More fundamentally, behavioural economics drawing from psychology has increasingly challenged the hypothesis of an ever optimising agent in favour of models relying more on associative thinking and heuristics. To quote Kahneman (2011, pp. 97-98) "The technical definition of *heuristic* is a simple procedure that helps find adequate, though often imperfect, answers to difficult questions." Based on the "representativeness" heuristic developed by Kahneman and Tversky (1974), Bordalo et al. (2017) develop a model of diagnostic expectations that seeks to explain in particular why in the aftermath of a tail

event (such as the collapse of Lehmann Brothers), expectations seem to shift suddenly and the subjective probability of such an event happening again seems to be overestimated.[2]

Conceptually, the hypothesis of imperfect information but "rational" (ever optimising) forecasters and the one of imperfect forecast models (with or without perfect information) are rather similar. Moreover, in reality, imperfect information and imperfect models may well reinforce each other. The distinction between the two is akin to what Handel & Schwartzstein (2018) call "frictions or mental gaps" as sources of non-optimal decision making. Empirically, the two may have somewhat different implications. Drawing from the sticky information and the noisy-information models, Coibion and Gorodnichenko (2015) argue, for example, that the aggregate forecast error each period should only depend on the aggregate forecast revision in that period. Testing this hypothesis, they find evidence in support of the rational expectations/incomplete information models. Conversely, at the level of the individual forecaster, a rational expectations/incomplete information model implies that the forecast error (of the individual forecaster) should not be systematically correlated with the information the forecaster *actually* had at the time of the forecast. Were this not to be the case, the rational forecaster could have improved (optimised) the forecast model using information in his/her possession at the time of the forecast. Below we rely on this observation to test whether any deviation from the REH at the level of individual firms is likely to have been the result only of imperfect information or also of some type of wrong inference model.

3. Data description and summary statistics

The data at our disposal comes from the "Survey on the Access to Finance of Enterprises" (SAFE) run jointly by the ECB and the European Commission.[3] This is a semi-annual survey on the financial conditions faced by non-financial firms in eleven euro area countries, Austria, Belgium, France, Finland, Germany, Greece, the Netherlands, Ireland, Italy, Portugal and Spain. In our analysis we consider the survey waves 1 to 18, covering the period from beginning of 2009 until March 2018.

[2] This would be in line with evidence by Shiller (1981) and others that expectations seem to be at times more volatile than the underlying variable (Gennaioli and Shleifer, 2018).

[3] The survey's main results are published in the ECB website every six months. For more information on the survey and its individual waves, see http://www.ecb.europa.eu/stats/money/surveys/sme/html/index.en.html.

Firms in the survey sample are randomly selected from the Dun & Bradstreet database. The sample is stratified by firm-size class, economic activity and country. Sample sizes for each economic activity are chosen to guarantee satisfactory representation across the four largest industries: manufacturing, construction, trade and services[4]. Also, the sample sizes are selected on the basis of representation at the country/size level. The specific individual that is surveyed in each firm is a top-level executive, usually a CFO or CEO. In smaller enterprises, this is often the owner. The questionnaire is administered in the local language.

At the beginning of the survey a bit more than 5000 firms were interviewed, but this number has increased over time reaching more than 10.000 since 2014. We exclude companies for which bank finance was considered "not relevant" and were therefore not asked the relevant questions. Thus, the starting sample has somewhat below 100.000 observations and 55.000 firms. Although we cover a relatively long time span of semi-annual data from 2009 to 2018, we do not get a rich panel structure in the dataset due to the fact that the sample includes a rotating panel of enterprises, aiming to obtain more accurate estimators at aggregate level. Depending on the variables of interest, the sample falls somewhat above 20000 observations when all firms are excluded that are not present at least in two consecutive waves. It falls below 10000 when at least three consecutive waves are needed. Most firms in the sample are small and medium enterprises (SMEs), two thirds of which have less than 50 employees and the overwhelming majority of them being older than 10 years. They are also mostly financially autonomous and not belonging to a business group or venture capitalist.

The main variables of interest are the expected change in the availability of bank finance in the next six months (compared to the last six months) and the respective actual change in the last six months (compared to the six preceding months)[5]. Both are discrete variables taking the values -1, 0, 1 for answers "deteriorated/remained unchanged/improved". Close to half of our observations in both variables are zeros. Despite the business cycle, companies in our sample often did not observe and did not expect their access to bank finance to change significantly, which does not mean that the cost did not change (these were asked in separate questions of the survey). This is perhaps to be expected in a bank based system, where bank-company relationships are relatively stable. The prevalence of "no change" answers may also indicate however that firms respond the middle category of "no change" for a wide range of

[4] These for groups cover the Nave 2 rev. sections mining, manufacturing, electricity, gas and water supply, wholesale and retail trade, repair of motor vehicles and motorcycles, transport, and other services to businesses or persons, such as hotels, restaurants or IT services. It excludes businesses operating in agriculture, public administration and financial services.
[5] In the SAFE questionnaire, these are questions Q9_a and Q23_b, respectively.

outcomes where a respective continuous variable may have been reported with small changes.

Figure 1 shows the two variables, aggregated for each wave. The horizontal line identifies the seventh wave, the fieldwork of which took place in September 2012, shortly after the announcement of the European Central Bank of the start of the Outright Monetary Transactions programme. The possible effects of this announcement are considered in more detail in the last section of the paper.

[FIGURE 1]

At the aggregate level, there is little to suggest that expectations lead the actual change in the availability of bank finance. Also, the expected change has remained above the actual change for most of the period until late 2015, an issue we consider in more detail below. The micro data from the panel of firms (present in at least two consecutive waves) show that lagged expectations have a somewhat higher dispersion than ex post changes in the same variable. This would go in the direction of the literature that finds expectations to be more volatile than the underlying variables. However, the available categorical information does not allow us to duel into this issue any further.

The SAFE survey also collects information on the factors companies consider to have affected the availability of bank finance in the previous period and whether these factors have deteriorated/remained unchanged/improved in the last six months[6]. The factors include the (1) general economic outlook (insofar as it affects the availability of external financing), (2) the enterprise-specific outlook with respect to the sales and profitability or business plan (again insofar as it affects the availability of external financing for the company), (3) willingness of banks to provide credit to the enterprise, (4) the enterprise's own capital (capital provided by the owners or shareholders of the enterprise) and (5) the enterprise's credit history. Figure 2 shows the aggregated data for these factors.

[FIGURE 2]

Broadly speaking, all five variables, when aggregated, show a similar pattern as those in Figure 1. The two variables that refer more to the (macro) environment, namely the general economic environment and the willingness of banks to provide credit, show more pronounced

[6] This is question Q11 in the SAFE questionnaire.

movements over the cycle than is the case for the three firm-specific factors. From the latter, sales and profits of firms also show marked variation over the cycle.

Table 1 summarises firms' perceptions on the availability of finance and market conditions. In the upper part we see that firms expected on average their availability of bank loans to increase and reported also increasing actual availability. However, firms tended to make small expectation errors on average, pointing to somewhat too "optimistic" expectations in the availability of bank loans. About 56% of firms make on average no expectation errors and the remaining ones are equally distributed between negative and positive errors. Firms' replies point to a negative impact of the general economic outlook on bank credit availability during the whole sample period (7%, which is read as net percentage[7]), an improved willingness of banks to provide credit (2%) and no positive nor negative effect from the enterprise-specific outlook. The latter includes firms' perceptions related to their sales, profitability and business plans. Finally, a higher percentage of firms consider improvements in their own capital (14%) and credit history (16%) as factors affecting the availability of external finance. Looking at their financial situation in the previous six months, firms were more positive about their turnover (15%), a bit less on their profits (8%) and few of them reported increasing interest expenses (4%).

[TABLE 1]

4. Basic empirical model of expectations

If we denote the availability of bank finance for firm *i* at time *t* as $y_{i,t}$, the two main variables of interest can be defined as

$$R_{i,t} = y_{i,t} - y_{i,t-1}$$

$$E_{i,t} = y_{i,t}^{\boldsymbol{exp}} - y_{i,t}$$

The superscript *exp* denotes the forecast of the availability of bank finance as of *t* for *t*+1. Variable R_{it} denotes the "realised" changes in bank finance availability for company *i* over

[7] The average values can be considered as a net percentage, ie. the difference between the percentage of firms replying that there were improvements minus the percentage of firms replying that there were deteriorations in the general economic outlook.

the last six months, while E_{it} denotes the expected such change over the next six months. We may further define the forecast error of company i at time t as:

$$FE_{i,t} = R_{i,t} - E_{i,t-1}$$

Finally, we denote by Ω_{it} the change in the factors affecting bank finance availability, as described above. These factors are good proxies for the "news" in the information set of a company, i.e. relevant new information available to the firm when forming its expectations concerning the availability of bank credit that far. The basic model of expectations can thus be written as

$$E_{i,t} = f\{R_{i,t}, \Omega_{i,t}, FE_{i,t}\} \quad (1)$$

In words, the expected change in the availability of bank finance by company i as of time t, E_{it}, is a function of the (realised) change in the availability of bank finance for company i at time t, the "news" (changes in the information set of company i) at t compared to the previous period and the last forecast error. The forecast error is in principle a feature of adaptive expectations, but in practice it may also correlate to unobserved (structural) characteristics of the company even within a rational expectations' model. To capture some of the effect of the structural characteristics, a set of control dummies is also introduced referring to ownership (family owned), operational autonomy status, size class, age and industrial sector.

All regressions also include interactive country-wave dummies. These may capture various macro-economic events as well as any collective waves of "optimism or pessimism" that may be affecting the expectations of firms. Interactive country-wave dummies "remove" much variation from the data. One could consider replacing these with an equivalent country specific random effects model if one believed that there is no systematic relation of the country macro cycle and the independent variables of interest. As it turns out, the choice of having fixed dummies or random effects is not a major issue. All estimates remain very similar and qualitative conclusions remain identical when estimating the same models without controlling for the country specific business cycle. Overall, the country – wave dummies do offer some useful information, as mentioned below. We thus opt to show all regressions with the dummies included.

The model is written very much from the point of view of the company. The variables in Ω_i are as reported by company i. If there is sticky, imperfect information or inattention, then

each company may perceive a different set of "news" at each moment in time. At this stage, there is no suggestion whether this information is used by the company within a structural model of the economy, as in REH, or as part of a more extrapolative forecast mechanism. Higher lags may also be of importance in an extrapolative model and are tested in the annex.

Note that the model is written as a growth model (all variables are in changes) because this is how the information is available to us from the survey (see below). In particular, we only know if the firm expects bank finance availability to improve, remain the same or deteriorated and similarly for the past values and the other independent variables. In an error correction model, forecast may also depend however on the distance of the current availability from what the firm considers as long term or "normal" availability of bank finance. We come back to this point below.

All models are estimated by maximum likelihood, applying clustered standard errors at firm level to allow for heteroscedasticity and correct for potential autocorrelation in some specifications. We use a firm-specific random effects model to allow for possible stochastic firm-specific factors, such as some respondents being consistently more "optimists" or more "pessimists".

The results of the estimation are presented in Table 2. Column 1 presents a simple version of the extrapolative model in which the expected change in the availability of bank finance next period only depends on how this variable changed during the current period. For short, we can call this the autoregressive term. The model also includes the control dummies as explained above. As expected, past changes in the availability of bank financing and future forecasts of the same variable strongly correlate. When checking the structural firm characteristics, the estimates suggest that, conditional on the autoregressive term, family-based, autonomous and smaller firms expected on average that their availability of bank financing would deteriorate more (or improve less) than their bigger, well-connected counterparts[8]. Perhaps somewhat surprising, the results also suggest that the younger companies tended to have more upbeat expectations about the change in bank financial availability compared to older counterparts (but see below).

[TABLE 2]

[8] As for sectoral characteristics, which are not reported, construction and trade reveal significantly negative expectations with reference to industry.

In column 2, the model is extended to include the variables in Ω_{it} that capture relevant new information in the information set of each company. It turns out that companies do update their expectations on the basis of "news" in their information set. All of the relevant independent variables available from the questionnaire are highly statistically significant and have the expected (positive) signs. Thus, the model strongly suggests that companies do not follow mechanically an extrapolative model of expectations in which the observed past availability of finance is simply projected into the future. Companies seem to adjust their extrapolative expectations on the basis of what they consider as relevant factors having affected the availability of finance the previous period. An improvement in the macro environment, bank credit supply or the company's financial situation, its sales and profits in the last six months all lead firms to expect better availability of bank finance in the coming period.

It should also be noted that many of the structural characteristics of the firm lose predictive power once the other independent variables are introduced in the regression of column 2. For example, the firm's size and sector (not reported) no longer have a statistically significant effect on the firm's expectations. This indicates that size and sector could have been proxies for different individual factors affecting the availability of bank finance, such as the willingness of banks to provide credit (supply side) or the company's own capital and credit history.

To give an idea of the quantitative impact of the news to expectations, Table 3 reports the average marginal effects per outcome category. The probability that bank finance may increase next period rises by about 4%, other things being equal, when the macro economy is perceived to have had a positive (rather than a stable) effect on the change of bank finance the last six months. The results show, that apart from the autoregressive term, the combined effect of the variables referring to the real market (macro and micro) is the strongest, followed by the information on (or perception of) a change in bank credit supply and finally by the change in the financial situation of the firm.

[TABLE 3]

The results turn out to be robust to different specifications of the model[9]. In column 3 of Table 2, we introduce the past forecast error, which, among other things, captures also some elements of adaptive expectations[10]. Expectations in this model no longer depend only on past outcomes but also on past expectations. The outcome of the coefficients strongly supports adaptive schemes that describe expectation mechanisms as a weighted function of both realisation and past expectations. Even though the number of observations falls sharply, as we now need to observe each company at least two successive survey waves, the main estimated coefficients of interest remain stable and statistically significant. The main effect of the lagged dependent variable is that the estimated coefficients of all dummies capturing structural characteristics are no longer statistically significant, as one might expect.

We further look whether the different information have any persistent effect on their expectation formation. Table A.1 in the appendix shows the baseline model where a lagged version of each independent variable is introduced. In line with Massenot & Pettinicchi (2017) we find that the perception of past changes of the dependent variable remains important with the same sign, even from earlier periods. As with adaptive expectation, the effect is, however, declining the farther the period is away (Nerlove, 1983). The same effect is found for the firm-specific condition *sales&profit,* indicating the persistent relevance of both adaptive elements and firm conditions. This finding can have important implications, as persistency could amplify attitudes of firms regarding their pessimism or optimism. Interesting in this respect is the result that previous information related to access to bank loans, such as the willingness of banks to provide credit, own capital, and credit history, is not relevant for the current expectations formation.

In the Annex, the results of different specifications/robustness checks of this model are provided for robustness check (Table A2). They broadly confirm our baseline results.

5. Rational expectations

[9] We run several regressions that explore the cross-industry, cross country and over-time dimensions of the sample (results available upon request).

[10] In principle, introducing a lagged dependent variable in a panel may bias the coefficients and an appropriate model, such as a GMM specification, would be required. Comparing the estimates of column 2 and 3, however, the estimates tend to be rather stable, which mitigates the need for an instrumental variables estimation that would raise other complications in a logit model with a very short time dimension.

The econometric results in the previous section suggest that firms use different pieces of updated information known to them when forming expectations, not just the autoregressive factors. This finding moreover is robust across different model specifications and sub-samples. However, these results do not tell us much about whether firms use this information efficiently in the spirit of rational expectations. To test this, one can follow the now established empirical approach of looking at the properties of the forecast errors.

Figure 3 shows the aggregate forecast error for each wave. It also shows the change in the realised variable, ΔR.

[FIGURE 3]

The aggregate series suggest that forecast errors have been serial correlated, contrary to what one would expect from REH. They have also been mostly negative during the earlier period, during the recession, and then positive during the recovery. Given that negative forecast errors signify that expectations were better (more "optimistic") than the subsequent realisation of the same variable, the series in Figure 3 would seem to contradict the idea that the recession was marked by a wave of pessimism and vice versa for the recovery.

Figure 4 allows a closer look at the source of these forecast errors. In particular, the three panels show separately what happened in the availability of bank finance for three different groups of firms each period: the "pessimists" that were forecasting a deterioration in the (change of the) availability of bank finance, those that forecasted that things would stay the same and the "optimists" that forecasted an improvement. Results are shown in each panel as a ratio to all observations of that panel (e.g. in the first panel as a ratio of all "pessimists"). What one can see is that the forecast of the "pessimists" and the "optimists" were right only about 20%-40% of the time. Most commonly, though an improvement or deterioration was forecasted, the change in the availability of bank finance was reported subsequently to have remained as before (or even moved in the opposite direction). Only in the middle panel, forecasts and realisations seemed to match more often. One can also note that overall the number of times the "optimists" got it wrong are more than that of the "pessimists", especially in the earlier part of the sample period. We revisit this observation below.

[FIGURE 4]

Lui et al. (2011) propose two non-parametric tests of rational expectations based on information such as the one presented in Figure 4. The first of the two tests assumes that

when firms were reporting the categorical values, they actually considered in which of the categories the mode of the underlying distribution was. In the second test, the assumption is that they were thinking of the median. For what concerns the mode, the test essentially comes down to checking whether the forecast turn out to be correct more than incorrect. In the test of the median, the forecast would need to be correct at least 50% of the time. Both are based on an assumption that outcomes are independent across firms. As is easily seen from the Figure 4, both tests clearly reject the null of rational expectations. Only in the case of firms expecting "no change" would the null not be rejected, but then the forecasting model would seem rather trivial.

In order to examine the properties of the forecast error in more detail, we consider the following model:

$$FE_{i,t} = g\{R_{i,t-1}, \Omega_{i,t-1}, FE_{i,t-1}\} \quad (2)$$

The left hand side in (2) is the difference between the actual changes in the availability of bank finance at *t* minus the predicted change as of *t-1*. Under rational expectations or indeed under a more general hypothesis that companies use efficiently the information at their disposal, we would expect that the rhs variables in g{} cannot systematically predict the forecast error $FE_{i,t}$. In particular, we would not normally expect any serial correlation in the forecast errors unless one believes that there has been a succession of (fundamentally unpredictable) macroeconomic shocks affecting many companies in the same direction.

It is important to note that the test of rationality through the predictive power of the variables in $g\{\}$ is stronger than is usually the case in the literature. In (2), the rhs contains on purpose *only idiosyncratic information that the company is known to have possessed when forming its forecasts and has itself identified as relevant for the availability of bank finance.* Unlike public information often used in this type of tests, there is no doubt that the firms were aware and attentive to this information. Thus, to repeat the point made above, if the economic actors are rational, *conditional to the true information available to them at the time of forming the expectations*, forecasts should normally fulfil the prescriptions of the REH and this irrespectively of whether information is sticky, noisy or economic actors are inattentive.

Also note that the regressions below all control for the effects of the country's business cycle, the sector and firm structural characteristics. The test of REH is therefore stronger than usual

as we test for systematic relations between forecast errors and variables in the information set of firms, conditional on the macro cycle and the structural characteristics of firms.

Table 4 shows the results of the ordered logit estimation of model (2). In the first column we see that past realisations are negatively related to the expectation error. In other words, firms that reported improved availability of bank loans in the last six months are making, on average, an expectation that proves ex-post to be too "optimistic".

[TABLE 4]

The size and age variables (not reported) also show a significant correlation with the expectation error. This may suggest that there is systematic correlation of some firm characteristics with the forecast error (Bachmann & Elstner, 2013, 2015). The systematic differences across firms' age and size could be related for example to limited capacities to collect and process information of younger or smaller firms (Berger & Udell, 1998).

When we expand the list of independent variables (column 2), the significance of $R_{i,t-1}$ diminishes. We observe instead that past information on the other independent variables has predictive power when it comes to the ex post forecast error. This is true, as said, even after controlling for the country business cycle, and firm structural characteristics. In particular, the variables on the general environment and the profit & sales of the company are negatively correlated with forecast errors, while the opposite is true with the financial variables related directly to bank finance, such as the willingness of banks to provide credit or the effect of the firm's capital. This result is moreover robust to changes in the sample, for example, dropping companies of some countries or some time periods.

One possible explanation is that firms tended to place high weight and overreact to developments in the "real" activity, such as demand, profits and the macro environment, compared to financial variables, notwithstanding the fact that they were forecasting a financial variable, i.e. the availability of bank finance. The reason for this may be that particularly the smaller firms would have been more aware and less uncertain about developments in their main (real) activity and the macro-factors affecting this rather than about what was happening in the financial market and how this would translate to changes in their own access to finance in the future. Thus, respondents would have tended to place more weight on something that they know better and know from the past that it correlates strongly

with the variable of interest rather than trying to use a complex structural model of the economy (Kahneman, 2011).

In column 3 of Table 4, the lagged forecast error is also introduced among the independent variables. The results confirm that there is positive serial correlation among forecast errors. The rest of the estimates change relatively little, at least in qualitative terms. Though the results in Table 4 reject the orthogonality condition of REH, it should also be mentioned that the explanatory power in all regressions is exceptionally low even for this type of models and with largely cross sectional data. This is also confirmed by Table 5, where the marginal effects of the various variables are shown.

[TABLE 5]

Further, the time pattern of forecast errors observed in Figure 3 is confirmed by the estimated coefficient of the country-wave dummies (not shown). In particular, the estimated coefficients are negative for all waves and all countries. This means that, conditional on the independent variables and the structural characteristics of companies, companies have tended to forecast better availability of bank finance than what turned out to be the case, more so in the earlier period of the sample, during the years of recession. Also, the estimates suggest that companies in countries under particular stress during the recession, such as Greece, Ireland, Italy, Portugal and Italy, the conditional forecast errors tended to be more negative in the recession, while the opposite was true in the recovery.

The interpretation of this pattern is not obvious but possibly points to the use of some type of Error Correction Mechanism (ECM) in the expectation formation of companies. According to ECM, the forecast of each company would also depend on how far the company perceived (the *level* of) the availability of finance to be from the "normal" or "long term" equilibrium value. Thus, during the recession, the availability of finance fell sharply in stressed countries, leading companies there to expect a relatively faster recovery, other things being equal. During the more recent years of recovery, this was no longer the case, possibly as the gap from the (possibly country specific) long term equilibrium was now closed. This would be in line, for example, with the finding that the various policy measures discussed below tended to help more companies to regain access to bank finance in countries where banks were more under stress (Ferrando et al., 2018) – but see section 7 below. Unfortunately, our data do not provide information on levels but only on changes from one period to another. We have no way therefore to introduce a true error correction term in order to test this hypothesis and, as

a result, we treat the time variation of forecast error captured by the country-wave dummies as essentially unexplained. The reaction of companies to policy announcements is however taken up again in the last section.

The conclusion from this section is that forecast errors are systematically correlated with information known to the firms at the time the expectations were formed. They also tend to be serially correlated. This is moreover true, even when controlling for macroeconomic shocks and structural characteristics of the firms. Though this tends to reject the REH, it is difficult to say how important quantitatively these deviations from the REH are for the single firm.

6. Heterogeneity and attentiveness

Both the hypotheses of rational expectations with incomplete information and that of incomplete forecast models are likely to give rise to more heterogeneity and disagreement among forecasters than would be the case if all forecasters were using anything close to a single (correct) model of the economy and a single (complete) set of information The rational inattentiveness hypothesis advanced the idea that heterogeneity in expectations is not only due to some random process or structural characteristics of the firm (e.g. size), but also the result of a deliberate choice of different (rational) forecasters to invest in information acquisition.[11] Thus, for given costs of acquiring the relevant data and processing it, the rational inattention models suggest that a firm will devote more resources to track information when this is expected to affect more its profits and will then make systematically less errors in forecasting the respective variable compared say to another firm for which this variable is less relevant. Relevance of the expectations may moreover change over time depending on market conditions (Coibion et al., 2018). In the context of our data, we proxy

[11] Several streams in the economic literature have long highlighted that there are indeed differences when it comes, for example, to information used to form expectations. Souleles (2004) and Bach & Elstner (2013) find systematic biases of forecast according to consumers' and firms' structural characteristics. The models of Brock & Hommes (1997), Branch (2004) and Dominitz & Manski (2005) all rely on the concept of difference strategies of expectation formation mechanisms according to some degree of information sophistication. Rational inattention models the issue of endogeneity in information acquisition to the fore (Sims, 2003)

"relevance" by identifying those cases where a firm reported that it "needs" bank finance in the period ahead.[12]

Relevance and intention to use bank credit may not be the only factor affecting the information and thus accuracy of the forecast of a firm. If information about the actual credit conditions is not readily available and requires effort to get, then a close firm-bank relationship may also be of importance. In our sample we have no information on such relation, but we do know whether a firm used bank credit in the period preceding the forecast. We can test therefore whether this recent familiarity/proximity to the bank system has an impact on its forecast of future bank availability. Also, more conventionally, we test whether structural characteristics of the company, e.g. size, age, autonomy, family based may play a role.

To test the hypothesis that firms are systematically more accurate in their forecasts when bank credit is more relevant for their future plans and/or when they had recent exposure to the banking system, we need some metric of forecast accuracy using the categorical data at our disposal. One such measure could be, for example, the absolute value of the forecast error. This is a 0/1 variable that measures the number of mistaken forecasts a company makes (e.g. forecasting that bank credit availability will improve when it stayed the same). As a measure of forecast ability, this measure is intuitive but has the drawback that it depends heavily on the stochastic environment within which each company operates. For example, smaller companies may have to live with more unanticipated shocks, which will typically lead to more forecast errors, notwithstanding that they may be equally well informed and able to forecast the availability of bank finance next period. We propose therefore a measure of "relative inaccuracy" of expectations by comparing the (absolute value of the) forecast error with the absolute value of the actual change in the availability of bank finance R_i.

In particular, if we denote with ΔR_{it+1} the change in R_i between t and t+1, we define relative forecast inaccuracy as

$$(3) \qquad P_{i,t+1} = |FE_{i,t+1}| - |\Delta R_{i,t+1}|$$

One intuitive way of thinking of P_i is as a measure of the absolute forecast error of company i compared to the theoretical forecast error the company would have made had it used a naïve

[12] To recall that all firms in our sample have identified bank finance as "relevant" for them, though only about a third has reported in any single period that it "needs" or, separately, that it has "used" bank finance.

expectation model in which the expected change next period to be same as in the current period. Thus, compared to the absolute value of the forecast error, P_i shows the distance not from zero error but from the error from a hypothetical very simple expectations model. As a result, forecast errors carry a higher weight in (3) when they occur in a steady state environment, where the change in the availability of bank finance, R_i, "stays the same" from one period to another. Analogously, the expectations of a company are considered particularly accurate if there is no forecast error in an environment of high fluctuations in the actual value R_i (and thus of high $|\Delta R_i|$). We employ P_i as a (noisy) indicator of expectations inaccuracy. The higher it is, the more inaccurate the forecast of an enterprise is likely to be compared to the counterfactual expectations model. This allows for a metric to be used when testing for models of endogenous or exogenous inattention.

Figure 5 presents the aggregate data for all three components of equation (3). Note that the dispersion of the actual forecast error has been higher throughout the period than the forecast error from the counterfactual naïve model. This is another way of saying what was observed also earlier, namely that expectations seem to have been more volatile than the underlying variable. In the period under consideration, the absolute forecast error has tended to fall but so did also $|\Delta R_i|$, leaving the average relative inaccuracy with no clear downward trend.

[FIGURE 5]

To test whether "relevance" of bank finance and "familiarity" with the banking system have a systematic effect on forecast accuracy, the proposed measure of relative forecast inaccuracy is regressed in Table 6 against the relevant proxies as well as proxies of the cost of acquiring and processing information, such as such as size, firm age, whether it is autonomous or family owned. Country – wave and industry dummies are included in all regressions to capture the country specific business cycle and separate industry characteristics.

[TABLE 6]

In column (1), we can see that none of the firm characteristics has a significant effect on forecast accuracy, with the possible exception of medium-large companies forming somewhat more accurate forecasts than the small ones as one would expect. In columns (2) and (3), forecast inaccuracy is found to be negatively correlated with both proxies of "familiarity" (recent use) and "relevance" (need of bank credit). Recent familiarity with the banking sector or possible intention to request bank loans are found to improve the

forecasting ability of companies when it comes to expectations of bank finance availability, confirming the relevance of both backward and forward looking factors affecting forecast accuracy. Finally, the last column introduces both proxies together. The estimates suggest that larger firms and firms that have recent experience and familiarity with banks may be better placed to form more accurate expectations on the availability of future bank finance. This may be because dealing actively with the banking system provides the firm with early information and a better understanding of how the banking system works. Instead, "need of bank loans", introduced as the proxy of relevance, turns out not to be statistically significant, possibly because the same effect is captured by the variable on "use".

To explore what might have been different in the expectations of firms that were more familiar with the banking system (because of recent dealings), in Table 7 the expectation model of Table 2 (column 2) is re-estimated with a focus on the "informed" firms. In the first column, a dummy is introduced to identify these "informed" firms. The estimated coefficient turns out to be negative and significant. Knowing that companies have tended to be on average "overoptimistic" about the speed with which availability of bank finance would return to "normal", the negative coefficient suggests that "informed" firms tended to be somewhat more realistic and closer to the (ex post) actual change in the availability of bank finance.

The second column in Table 7 re-estimates the same model but only for the subsample of "informed" firms. The results suggest that, structurally, the expectation model of "informed" and "less informed" companies was not very different. Taking into account that estimates are not fully comparable between the two models in columns (1) and (2), it is interesting that the results are very similar despite the fact that only 1/3 of all observations are used in the latter. The tentative conclusion from this is that companies that have had recent proximity to banks may have better or additional information that helps them make somewhat more accurate forecast, but there is no evidence that they use fundamentally different expectations models than the rest.

[TABLE 7]

7. Expectations and policy announcements

Expectations have often been discussed in the literature in relation to the effectiveness and speed of transmission of macroeconomic policies and, in particular monetary policy, to economic activity. One of the main questions in this context remains whether and how fast the financial markets, companies and households anticipate the effects of new macroeconomic policy measures when these are announced or start being implemented. The concept of "forward guidance" in monetary policy and of "anchoring" inflation expectations relies on the very idea that financial market participants, businesses and households can anticipate the effects of a future monetary policy stance based on information communicated by the central bank at an earlier stage. The effect of the unconventional monetary policy measures on firms' expectations has in particular received some attention lately, as it was considered to be a potentially important channel in the transmission mechanism of monetary policy. (Boneva et al., 2016, Ferrando et al., 2018).

In what follows, the aim is to focus more sharply on the pure announcement effect of monetary policy on business expectations. Apart from being a potentially important channel of policy transmission, pure announcement effects, i.e. changes in expectations following a policy announcement controlling for other information in the information set of companies, provide indirect evidence of (at least partly) forward looking expectations. In particular, we explore whether, conditional on the other information that firms had in their information set, their expectations improved following the policy announcements of summer of 2012. We do so by employing a difference in differences model that uses as treatment group the "informed" firms identified in the previous section, namely firms that had been using bank finance in the previous period. We also use size as an alternative treatment group in line with what was discussed earlier.[13]

The period covered by our dataset contains a number of important policy announcements and interventions by the European Central Bank the impact of which is widely thought to have been very significant in shaping expectations and affecting the evaluation of risks in the financial markets.[14] For the purpose of examining the way policy announcements may affect

[13] To be sure, the "difference in differences" estimates below do not necessarily provide watertight evidence of forward looking expectations. An alternative or complementary interpretation could be that the treatment group of firms were the first to benefit from the effects a policy announcement on the markets and that this was not sufficiently controlled for by the independent variables. If this were to be the case, the evidence suggests heterogeneity in the transmission mechanism rather than heterogeneity in the expectation formation process of "informed" firms.

[14] For a more detailed description of the several monetary policy decisions taken by the ECB since the breakdown of the financial crisis see Hartmann and Smets (2018).

expectations of businesses, the measures agreed upon in the summer of 2012 present a particularly good case study. To recall, in early 2012, as a result of weak growth and fiscal slippages, risk premia of sovereign bond yields rose sharply in several stressed euro area countries seriously hampering the funding of banks in general. Financial tensions were rising fast threatening not only the banking system, but the very unity of the euro area. In the summer of 2012 some important policy decisions were agreed upon and announced. In the end of June 2012, the European Council agreed to create a European banking supervision mechanism and a resolution mechanism, a step towards building a banking union. In early August, the European Central Bank's Governing Council announced it would undertake outright monetary transactions (OMTs), a programme consisting of the purchase of sovereign bonds in secondary markets under strict conditions. Some days before that announcement, the President of the ECB delivered a speech now well-known for the quote "Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough." The technical framework of OMTs was announced on 6 September 2012. Financial markets are believed to have reacted to these policy announcements and by the end of 2013 government bond yields had returned to pre-crisis levels, despite the fact that the ECB did not actually purchase government bonds through the OMT Program. (Altavilla et al., 2014). As can be seen from Figure 6, the autumn of 2012 marks also a turning point for the access of companies to bank finance in both the "stressed" and the "non-stressed" countries. [15]

[FIGURE 6]

For completeness, it should be said that the sovereign debt crisis of that period left a damaging legacy, which led the way for a new phase of the crisis. This was characterized by the process of deleveraging of banks in many parts of the euro area – particularly in vulnerable countries –, which mainly involved a slow recovery in the lending to the real economy. To address this problem, the ECB sought to affect the whole range of interest rates that are relevant for private sector financing conditions. In particular, it announced in June 2014 the introduction of a credit easing package, which included targeted longer-term refinancing operations, specifically designed to support bank lending to the private sector. Further measures included an expanded Assets Purchase Program, with monthly purchases of public and private securities. The combined impact of these measures, which aimed to reduce

[15] See Ferrando et al. (2018) for an analysis of the impact of the announcement of the ECB's OMT Program on small firms' access to finance.

market and bank-based financing costs, was visible in the continuous increase in the availability of bank loans as also signalled by the firms in our survey.

The summer 2012 marks an interesting turning point, where business expectations may have played a role. The aggregated expectations of future bank credit are shown in Figure 6 for both stressed and non-stressed countries. As mentioned, the OMT programme did not lead to any actual intervention in the bond market. Also, the single supervisory mechanism became active at a much later stage, in late 2014. Thus, in September 2012, when the fieldwork of the SAFE survey was carried out, no actual intervention had taken place on the basis of these announcements (though interest rates had been reduced by 25 basis points in July 2012 and stayed stable thereafter). Moreover, as can be seen from Figure 2, in September 2012 (2012w7) more companies than ever (in the history of the survey) reported that the willingness of banks to provide credit had deteriorate in the preceding six months. They also reported a deteriorating general economic environment. In other words, at that stage, conditions "on the ground" had not much improved for firms and policy interventions had not taken place. If policy announcement had an effect on business expectations this is likely to have been because firms anticipated the possible change in financial conditions in the future.

Concretely, the econometric strategy consists of identifying whether, conditional on the (otherwise negative) idiosyncratic news contained in the right hand side of (1), firms' expectations in September 2012 were higher, presumably as a result of anticipating the improvement of financial conditions that took place in the months following the announcement of a possible ECB intervention to the government bond market. Any macroeconomic effects of these announcements cannot be detected in the model, as these would be captured by the country-wave dummies (together with much else happening at the macro level). We use therefore, a difference-in-differences model. In particular, in line with what was discussed in the previous section, we test whether the expectations of larger firms and/or of firms that had been using bank credit in the six months before September 2012 changed to the better (more than for the control group) in the September survey wave, immediately after the announcement of the OMT. The impact on financial conditions of a possible intervention of the ECB in the government bond market is unlikely to have been easy to anticipate. It is therefore reasonable to expect that firms that were actively dealing with banks, as discussed in the previous section, would have been the first ones to adapt their expectations. As a falsification test, we consider the same model introducing the differences in differences term one wave earlier (in March 2012) and one wave later (in March 2013).

The main results of this exercise can be found in Table 8. Only the estimates for the variables of interest are presented, as the estimated coefficients of the other variables stay very close to those found earlier in Tables 2 and 7. [16]

[TABLE 8]

In the first column, the expectations model of Table 2, column 2 is amended with a term identifying the medium-large companies (with more than 50 employees) in the wave of September 2012. As was found in section 4, size does not have a significant difference to expectations overall once we control for other variables. However, in September 2012, the conditional expectations of medium-large firms on future bank availability were significantly higher than those of smaller firms, indicating that larger firms anticipated the turning point in the financial conditions earlier than the smaller firms.

In the second column, the expectations model (of Table 7, column (1)) is amended to control for the change in expectations of informed firms in September of 2012, immediately after the OMT announcement. Notwithstanding that these firms tended to have less optimistic forecasts overall (as was also seen in the previous section), the estimates suggest that their expectations improved in September 2012 more than in the control group (that had no dealings with banks in the preceding six months). Again, in line with the previous section, this could be interpreted as a better ability of the "informed" firms to anticipate the turning point in the availability of finance that followed in late 2012.

To explore this result somewhat further, we consider next separately the expectations of firms in stressed and non-stressed countries. A possible intervention of the ECB in the government bond market would have benefited in the first instance banks and companies in stressed countries (due to the home bias in government bond holdings). But given the interconnectedness of the banking system and the risks of contagion, an intervention in the government bond market was likely to affect financial market conditions throughout the euro area. The question is whether companies in both stressed and non-stressed countries would have perceived this and adjusted their expectations on bank credit availability as a result. Table 9 suggests that this was indeed the case. Conditional expectations of large and "informed" firms in both stressed and non-stressed countries were higher in September 2012

[16] We use the model in column 2 (rather than that in column 3) of Table 2 as this allows us to use a much larger sample and gain in power while losing little in terms of generality. Also, for ease of presentation, we control the structural differences for only two size classes, instead of four as was the case in earlier models, but this does not change any of the results.

than otherwise predicted by the model. These results are complementary to a recent study by Ferrando et al. (2019), though their analysis focuses on a particular channel whereby unconventional monetary policy affects expectations. In a reduced-size sample, which matches our survey firm-level data with bank-level information, they find that expectations improved significantly more after the OMT announcement for firms borrowing from banks with high balance sheet exposures to impaired sovereign debt (which are mostly banks from stressed countries).

[TABLE 9]

In our analysis we reach an additional interesting conclusion: the effect of OMT on the expectations of larger firms turns out to be more prominent (and statistically significant) in non-stressed countries. This may indicate that large companies in non-stressed countries were particularly interested and stood to benefit more from a macroeconomic policy announcement that aimed in the short run at "calming" the markets and avoiding any ripple effects through the financial system of the euro area. Large firms in stressed countries, though also benefiting from better financial conditions in general, were still looking at a stressed local banking system that would still need to deleverage in the future. The improvement of their expectations from a policy intervention could therefore be somewhat more muted.

In Tables A3 and A4, in the Appendix, the results of falsification tests are presented. In particular, results of both Table 8 and 9 are tested using different treatment groups. Overall, these results suggest that the positive changes in the expectations of the treatment groups observed in September 2012 cannot be detected one before or after that survey wave, with the possible exception of the expectations of "informed" companies in non-stressed countries one period before the OMT. Overall the results provide support to the hypothesis that companies, at least the larger and "informed" ones did change their expectations to the better in September 2012, after the OMT intervention, anticipating the subsequent improvement in bank finance availability. This provides tentative evidence of forward looking elements in the expectation formation of non-financial companies, incorporated in what otherwise looks (from previous sections) like an adaptive expectations model.

8. Conclusions

This paper delivers new evidence on the expectations formation of non-financial companies concerning the availability of bank finance based on survey data from 11 euro area countries. The results suggest that the forecasts of non-financial companies follow an adaptive expectations pattern, though this does not seem to be based on a mechanical rule. The evidence strongly supports the hypothesis that these firms update their expectations on the basis of new information on a wider range of variables than, for example, a simple extrapolative model would have suggested.

As in previous literature, the hypothesis that expectations fulfil the (orthogonality) conditions of the rational expectations hypothesis is rejected by the data. Interestingly, we find evidence that the expectation error is correlated with information that we know companies had in their information set at the time of forming their expectations and had also identified as relevant for the availability of external finance in the past. This finding indicates that deviations from the rational expectations hypothesis are unlikely to have been solely due to information imperfections (e.g sticky information or inattentiveness to news). They possibly indicate some type of misspecification in the expectations' model firms are using. In particular, the evidence suggests that in the period under consideration, firms tended to give too much weight on the information more easily accessible and understandable, namely that on the sales and profits of the respective firm and the general economic environment.

After constructing an indicator of expectations "inaccuracy" at the firm level, we test and find some evidence that companies differ in their ability to forecast the availability of bank finance six months ahead. In particular, smaller firms and/or firms that were recently less exposed to (had not used) bank finance tend to do worse at forecasting its availability next period. This could be a sign of asymmetric/imperfect information. We cannot confirm however (rational) inattention plays a role. In particular, firms that report that they need bank finance and, thus presumably good forecasts are of more relevance to them, do not seem to be better at forecasting its availability (when we condition on the past use).

In the last section of the paper, the monetary policy announcements of late summer 2012 (among else on the OMT programme) offer an interesting natural experiment to test whether firms incorporate any forward looking elements in their expectations. Using a difference in differences model, we find some evidence that following the policy announcements, larger firms and "informed" firms revised positively their expectations, possibly anticipating in part

the turning point in the financial conditions, otherwise only detectable in the data of next survey wave.

Overall these results suggest that the mechanism non-financial firms use to form their expectations is much more complex than any single model commonly used would suggest. Their forecasts seem to combine both backward and forward looking elements. They also seem to react to recent information, including policy announcements, albeit not in the efficient way one would expect under REH. Moreover, firms seem to differ in their ability to foreast future bank credit availability in a way that changes over time, possibly depending on their information channel at the time of their forecast.. Interestingly, monetary policy announcements – in our case a major announcement in a critical moment such as the OMT – do have a direct impact on the expectations of non-financial firms, at least of those better informed and/or larger.

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10. Tables and Figures

Table 1: Summary statistics for the sample used in the analysis

VARIABLES	N	Mean	Std. dev	Min	Max
Dependent Variables					
expectation	33,607	0.051	0.62	-1	1
realisation	32,088	0.032	0.62	-1	1
forecast error	27,499	-0.012	0.76	-2	2
forecast error in absolute value	27,499	0.49	0.59	0	2
change in availability in absolute value	26,068	0.42	0.56	0	2
forecast inaccuracy index	25,280	0.064	0.66	-2	2
Business Conditions					
general economy	45,768	-0.068	0.73	-1	1
willingness of banks to provide credit	36,346	0.020	0.70	-1	1
own capital	46,857	0.14	0.64	-1	1
credit history	45,259	0.16	0.59	-1	1
sales&profit	45,909	0.088	0.72	-1	1
Firm Characteristics					
use of bank loans	46,702	0.30	0.46	0	1
need more bank loans	31,660	0.24	0.43	0	1
credit constraints	33,106	0.13	0.34	0	1
financing pressure	36,594	0.42	0.49	0	1
medium large	47,303	0.65	0.48	0	1
size: micro	47,303	0.34	0.47	0	1
size: small	47,303	0.31	0.46	0	1
size: medium	47,303	0.26	0.44	0	1
size: large	47,303	0.083	0.28	0	1
Age: below 2 years	46,730	0.0090	0.094	0	1
age: 2-4 years	46,730	0.045	0.21	0	1
age: 5-9 years	46,730	0.11	0.31	0	1
age: above 9 years	46,730	0.84	0.37	0	1
Autonomous	47,295	0.86	0.35	0	1
family-owned	47,266	0.81	0.39	0	1
sector: industry	47,303	0.29	0.45	0	1
sector: construction	47,303	0.10	0.30	0	1
sector: trade	47,303	0.26	0.44	0	1
sector: service	47,303	0.34	0.48	0	1

Note: This table presents the summary statistics for the variables used in the empirical tests. *Expectation* is a categorical variable of a firm's expectation on the availability of bank loans to either deteriorate (-1), remain unchanged (0), or improve (1) in the next six months. *Realisation* is a categorical variables of a firm's perception on the availability of bank loans to have either deteriorated (-1), remained unchanged (0), or improved (1) in the past six months. *Forecast error* is a categorical variable, expressed by the difference between lagged expectations and realisation, that can take on the values -2, -1, 0, 1, 2. *Forecast error in absolute value* is a categorical variable that takes the values 0, 1, 2. *Change in availability in absolute value* is a categorical variable defined as the difference between actual and lagged realisation that can take on the values -2, -1, 0, 1, 2. *Forecast inaccuracy index* is a categorical variable, defined as the difference between the absolute expectation error and the absolute change in the availability of bank loans, that can take on the values -2, -1, 0, 1, 2. *Use of bank loans* is a dummy variable that are equal to 1 if the firm has used bank loans or bank products such as credit lines or overdrafts, respectively, in the past six months.

Credit constraints is a dummy variable equal to 1 if the firm applied for bank financing in the past 6 months, but it was discouraged from applying because it expected to be rejected, or it applied but its loan application was denied, or it applied and got less than 75% of the requested amount, or it refused the loan because the cost was too high. *Financing pressure* is a dummy equal to 1 if firms consider finance as a major problem for their business activity. *Family-owned* is a dummy equal to 1 if the company has one owner only, or is run by a family or entrepreneurs. *Autonomous* is a dummy equal to 1 if the company an autonomous profit-oriented enterprise, making independent financial decisions. *Industry* is a dummy equal to 1 if the company's main activity is in manufacturing or mining. *Construction* is a dummy equal to 1 if company's main activity is in construction. *Trade* is a dummy equal to 1 if the company's main activity is in wholesale or retail trade. *Service* is a dummy equal to 1 if the company's main activity is in transport, real estate, and other services to businesses and persons. *Micro* is a dummy variable equal to 1 if the firm has between 1 and 9 employees. *Small* is a dummy variable equal to 1 if the firm has between 10 and 49 employees. *Medium* is a dummy variable equal to 1 if the firm has between 50 and 249 employees. *Large* is a dummy variable equal to 1 if the firm has 250+ employees.. *General economy* is a categorical variable of the firms' perception of the general economic outlook during the past six months, that can take on the values deteriorated (-1), remained unchanged (0), or improved (1). *Willingness of banks to provide credit* is a categorical variable of the firms' perception of the willingness of banks to provide credit during the past six months, that can take on the values deteriorated (-1), remained unchanged (0), or improved (1). *Own capital* is a categorical variable of the firms' perception of the state of its own capital during the past six months, that can take on the values deteriorated (-1), remained unchanged (0), or improved (1). *Credit history* is a categorical variable of the firms' perception of its own credit history during the past six months, that can take on the values deteriorated (-1), remained unchanged (0), or improved (1). *Sales & profit* is a categorical variable of the firms' perception of its sales and profits during the past six months, that can take on the values deteriorated (-1), remained unchanged (0), or improved (1).

Table 2: Expectations on the availability of bank loans

VARIABLES	(1)	(2)	(3)
expectation error			-0.495***
			(0.027)
realisation	1.278***	0.726***	1.199***
	(0.015)	(0.018)	(0.042)
general economy		0.317***	0.341***
		(0.014)	(0.026)
sales&profit		0.329***	0.276***
		(0.014)	(0.025)
willingness of banks to provide credit		0.541***	0.531***
		(0.017)	(0.031)
own capital		0.094***	0.097***
		(0.014)	(0.027)
credit history		0.131***	0.138***
		(0.015)	(0.028)
family-owned	-0.052***	-0.039*	-0.054
	(0.020)	(0.021)	(0.040)
autonomous	-0.057**	-0.064***	-0.052
	(0.023)	(0.025)	(0.048)
size: small	0.091***	-0.008	-0.046
	(0.019)	(0.020)	(0.038)
size: medium	0.191***	0.034	-0.011
	(0.021)	(0.022)	(0.041)
size: large	0.203***	0.019	-0.056
	(0.030)	(0.031)	(0.056)
age: 2-4 years	-0.185***	-0.100	0.050
	(0.070)	(0.078)	(0.172)
age: 5-9 years	-0.227***	-0.121	-0.012
	(0.066)	(0.074)	(0.166)
age: >9 years	-0.336***	-0.180**	-0.019
	(0.063)	(0.071)	(0.162)
/cut1	0.326	2.018***	2.274***
	(0.327)	(0.365)	(0.395)
/cut2	3.643***	5.532***	5.969***
	(0.328)	(0.366)	(0.398)
Observations	91,432	83,303	24,630
Industry FE	Yes	Yes	Yes
Country*Wave Dummy	Yes	Yes	Yes
VCE_Cluster	Permid	Permid	Permid
Pseudo R-squared	0.106	0.144	0.167

Note: This table presents estimates of expectations on the availability of bank loans. The model is estimated using ordered logit. The estimation period is June 2009 –March 2018. All regressions include fixed effects as specified. Standard errors clustered at the firm level appear in parentheses. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 3: Average marginal effects of expectations on the availability of bank loans

VARIABLES	(1) *Exp= -1*	(2) *Exp = 0*	(3) *Exp = 1*
realisation	-0.091***	-0.008***	0.099***
	(0.002)	(0.001)	(0.002)
general economy	-0.040***	-0.003***	0.043***
	(0.002)	(0.000)	(0.002)
sales&profit	-0.041***	-0.004***	0.045***
	(0.002)	(0.000)	(0.002)
willingness of banks to provide credit	-0.068***	-0.006***	0.074***
	(0.002)	(0.001)	(0.002)
own capital	-0.012***	-0.001***	0.013***
	(0.002)	(0.000)	(0.002)
credit history	-0.016***	-0.001***	0.018***
	(0.002)	(0.000)	(0.002)

Note: This table presents the average marginal effects of the estimates of expectations on the availability of bank loans as in Column 2 of Table 2 for each outcome category. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 4: Forecast errors on the availability of bank loans

VARIABLES	(1)	(2)	(3)
lagged forecast error			0.146***
			(0.038)
lagged realisation	-0.070***	-0.037	-0.105*
	(0.024)	(0.031)	(0.058)
lagged general economy		-0.116***	-0.128***
		(0.024)	(0.038)
lagged sales&profit		-0.182***	-0.145***
		(0.023)	(0.036)
lagged willingness of banks to provide credit		0.055*	0.078*
		(0.028)	(0.045)
lagged own capital		0.090***	0.114***
		(0.025)	(0.038)
lagged credit history		0.013	-0.012
		(0.026)	(0.041)
/cut1	-3.720***	-4.053***	-3.881***
	(0.364)	(0.402)	(0.621)
/cut2	-1.373***	-1.690***	-1.453**
	(0.362)	(0.399)	(0.619)
/cut3	1.220***	0.914**	1.233**
	(0.362)	(0.399)	(0.619)
/cut4	3.875***	3.584***	4.114***
	(0.365)	(0.402)	(0.624)
Observations	24,940	23,292	9,960
Firm controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Country*Wave Dummy	Yes	Yes	Yes
VCE_Cluster	Permid	Permid	Permid
Pseudo R-squared	0.0132	0.0163	0.0197

Note: This table presents estimates of the forecast error on the availability of bank loans. The model is estimated using ordered logit. Firm controls are *family-owned* and *autonomous*. The estimation period is June 2009 –March 2018. See Table 1 for variable definitions. All regressions include fixed effects as specified. Standard errors clustered at the firm level appear in parentheses. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 5: Average marginal effects of forecast errors on the availability of bank loans

VARIABLES	(1) -2	(2) -1	(3) 0	(4) 1	(5) 2
lagged realisation	0.001	0.005	0.000	-0.005	-0.001
	(0.001)	(0.004)	(0.000)	(0.005)	(0.001)
lagged general economy	0.003***	0.016***	0.000	-0.017***	-0.002***
	(0.001)	(0.003)	(0.000)	(0.004)	(0.000)
lagged sales&profit	0.005***	0.025***	0.000	-0.027***	-0.004***
	(0.001)	(0.003)	(0.000)	(0.003)	(0.000)
lagged willingness of banks to provide credit	-0.001*	-0.008*	-0.000	0.008*	0.001*
	(0.001)	(0.004)	(0.000)	(0.004)	(0.001)
lagged own capital	-0.002***	-0.013***	-0.000	0.013***	0.002***
	(0.001)	(0.003)	(0.000)	(0.004)	(0.000)
lagged credit history	-0.000	-0.002	-0.000	0.002	0.000
	(0.001)	(0.004)	(0.000)	(0.004)	(0.001)

Note: This table presents the average marginal effects of the estimates of the forecast error on the availability of bank loans as in Column 2 Table 4 for each outcome category. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 6: Forecast inaccuracy in predicting the availability of bank loans

VARIABLES	(1) All sample	(2) Use of bank loans	(3) Need of bank loans	(4) Use + Need of bank loans
use of bank loans		-0.092***		-0.095***
		(0.027)		(0.029)
need more bl			-0.073**	-0.047
			(0.032)	(0.033)
lagged family-owned	-0.039	-0.034	-0.020	-0.016
	(0.037)	(0.037)	(0.038)	(0.038)
lagged autonomous	0.062	0.070	0.052	0.055
	(0.045)	(0.045)	(0.047)	(0.047)
lagged medium-large	-0.071**	-0.057*	-0.060**	-0.048
	(0.029)	(0.030)	(0.030)	(0.030)
lagged age: 2-4 years	0.046	0.029	0.041	0.024
	(0.139)	(0.139)	(0.146)	(0.146)
lagged age: 5-9 years	-0.050	-0.063	-0.040	-0.054
	(0.131)	(0.131)	(0.136)	(0.136)
lagged age: >9 years	-0.018	-0.029	-0.020	-0.033
	(0.126)	(0.126)	(0.131)	(0.131)
/cut1	-4.321***	-4.378***	-4.317***	-4.378***
	(0.322)	(0.325)	(0.324)	(0.326)
/cut2	-1.104***	-1.163***	-1.104***	-1.167***
	(0.315)	(0.317)	(0.316)	(0.318)
/cut3	1.875***	1.817***	1.859***	1.797***
	(0.315)	(0.317)	(0.317)	(0.319)
/cut4	4.926***	4.870***	4.900***	4.838***
	(0.321)	(0.323)	(0.323)	(0.325)
Observations	24,940	24,846	23,624	23,545
Industry FE	Yes	Yes	Yes	Yes
Country*Wave Dummy	Yes	Yes	Yes	Yes
VCE_Cluster	Permid	Permid	Permid	Permid
Pseudo R-squared	0.00531	0.00555	0.00543	0.00568

Note: This table presents estimates of factors affecting the inaccuracy of forecasting the availability of bank loans. The model is estimated using ordered logit. The estimation period is June 2009 –March 2018. See Table 1 for variable definitions. All regressions include fixed effects as specified. Standard errors clustered at the firm level appear in parentheses. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 7: Expectations on the availability of bank loans when firms made use of bank loans

VARIABLES	(1) All firms	(2) Only firms that used bank loans
use of bank loans	-0.105***	
	(0.015)	
realisation	0.731***	0.618***
	(0.018)	(0.025)
general economy	0.316***	0.309***
	(0.014)	(0.021)
sales&profit	0.329***	0.323***
	(0.014)	(0.020)
willingness of banks to provide credit	0.540***	0.499***
	(0.017)	(0.024)
own capital	0.094***	0.089***
	(0.015)	(0.021)
credit history	0.129***	0.151***
	(0.015)	(0.022)
family-owned	-0.037*	-0.059*
	(0.021)	(0.032)
Autonomous	-0.058**	-0.055
	(0.025)	(0.038)
size: small	0.002	-0.021
	(0.020)	(0.032)
size: medium	0.053**	0.049
	(0.022)	(0.033)
size: large	0.044	0.056
	(0.031)	(0.043)
age: 2-4 years	-0.102	-0.186
	(0.078)	(0.125)
age: 5-9 years	-0.121	-0.214*
	(0.074)	(0.118)
age: >9 years	-0.177**	-0.272**
	(0.071)	(0.113)
/cut1	1.956***	1.686***
	(0.366)	(0.426)
/cut2	5.471***	5.098***
	(0.367)	(0.427)
Observations	82,968	36,007
Industry FE	Yes	Yes
Country*Wave Dummy	Yes	Yes
VCE_Cluster	Permid	Permid
Pseudo R-squared	0.144	0.133

Note: This table presents estimates of expectations on the availability of bank loans considering firms have used bank loans (column 1) and taking only the subsample of firms that have used bank loans (column 2). The model is estimated using ordered logit. The estimation period is June 2009 –March 2018. All regressions include fixed effects as specified. Standard errors clustered at the firm level appear in parentheses. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 8: Non-conventional monetary policy and expectations on the availability of bank loans: Difference-in-Differences

VARIABLES	(1) OMT x Size	(2) OMT x Use of bank loans
medium-large	0.007	
	(0.017)	
use of bank loans		-0.116***
		(0.016)
use of bank loans X OMT		0.203***
		(0.068)
medium large X OMT	0.276***	
	(0.070)	
use of bank loans X post_OMT		
use of bank loans X pre_OMT		
/cut1	2.128***	1.949***
	(0.362)	(0.366)
/cut2	5.641***	5.464***
	(0.363)	(0.367)
Observations	84,588	82,968
Business conditions	Yes	Yes
Firm controls	Yes	Yes
Industry FE	Yes	Yes
Country*Wave Dummy	Yes	Yes
VCE_Cluster	Permid	Permid
Pseudo R-squared	0.144	0.144

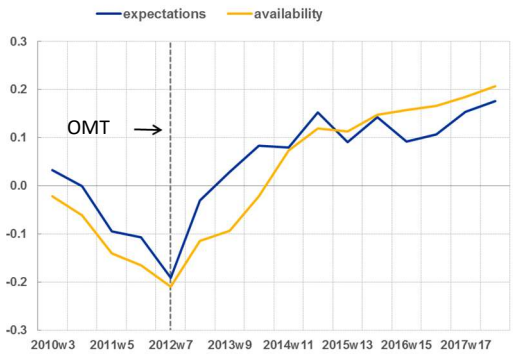
Note: This table presents difference in differences on the expectations on the availability of bank loans, where the use of bank loans and a dummy for medium and large firms are interacted with the dummy of unconventional monetary policy related to the OMT announcement. The dummy OMT is equal to 1 in 2012w7. The estimation period is June 2009 –March 2018. All regressions include fixed effects as specified. Standard errors clustered at the firm level appear in parentheses. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 9: Non-conventional monetary policy and expectations on the availability of bank loans among stressed and non-stressed countries: Difference-in-Differences

	STRESSED COUNTRIES		NON-STRESSED COUNTRIES	
VARIABLES	(1) OMT x Size	(2) OMT x Use of bank loans	(3) OMT x Size	(4) OMT x Use of bank loans
medium-large	-0.008		0.014	
	(0.026)		(0.024)	
use of bank loans		-0.050**		-0.179***
		(0.023)		(0.022)
medium large X OMT	0.172*		0.363***	
	(0.102)		(0.096)	
use of bank loans X OMT		0.210**		0.186**
		(0.098)		(0.094)
/cut1	1.888***	1.723***	2.170***	1.944***
	(0.128)	(0.170)	(0.383)	(0.388)
/cut2	5.206***	5.038***	5.866***	5.648***
	(0.133)	(0.173)	(0.385)	(0.390)
Observations	40,520	39,767	44,068	43,201
Business conditions	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Country*Wave Dummy	Yes	Yes	Yes	Yes
VCE_Cluster	Permid	Permid	Permid	Permid
Pseudo R-squared	0.151	0.152	0.134	0.135

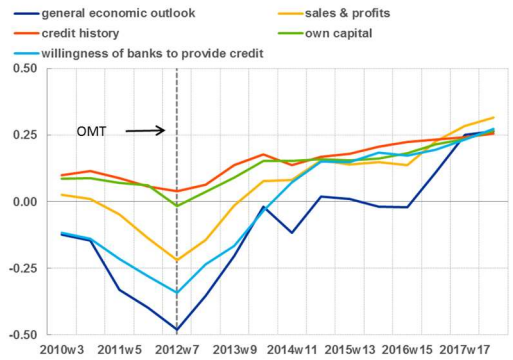
Note: This table presents difference in differences on the expectations on the availability of bank loans, where the use of bank loans and a dummy for medium and large firms are interacted with the dummy of unconventional monetary policy related to the OMT announcement. The dummy OMT is equal to 1 in 2012w7. The sample is split between stressed countries (Greece, Ireland, Italy, Spain and Portugal) and non-stressed countries (Austria, Belgium, Germany, Finland, France and the Netherlands). The model is estimated using ordered logit. The estimation period is June 2009 –March 2018. All regressions include fixed effects as specified. Standard errors clustered at the firm level appear in parentheses. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Figure 1: Firms' expectations of bank loan availability over time *(net percentages)*



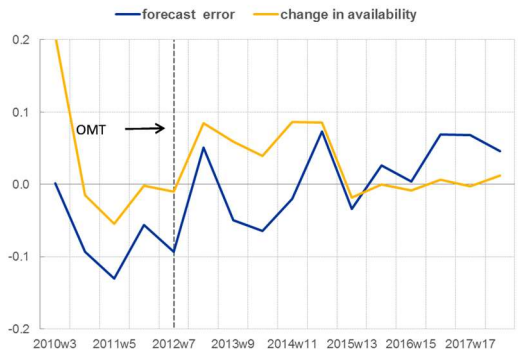
Note: The net percentage is the difference between the percentage of enterprises reporting an increase for a given factor and the percentage reporting a decrease. See Table 1 for variable definitions.

Figure 2: Firms' perceptions of business and market conditions over time *(net percentages)*



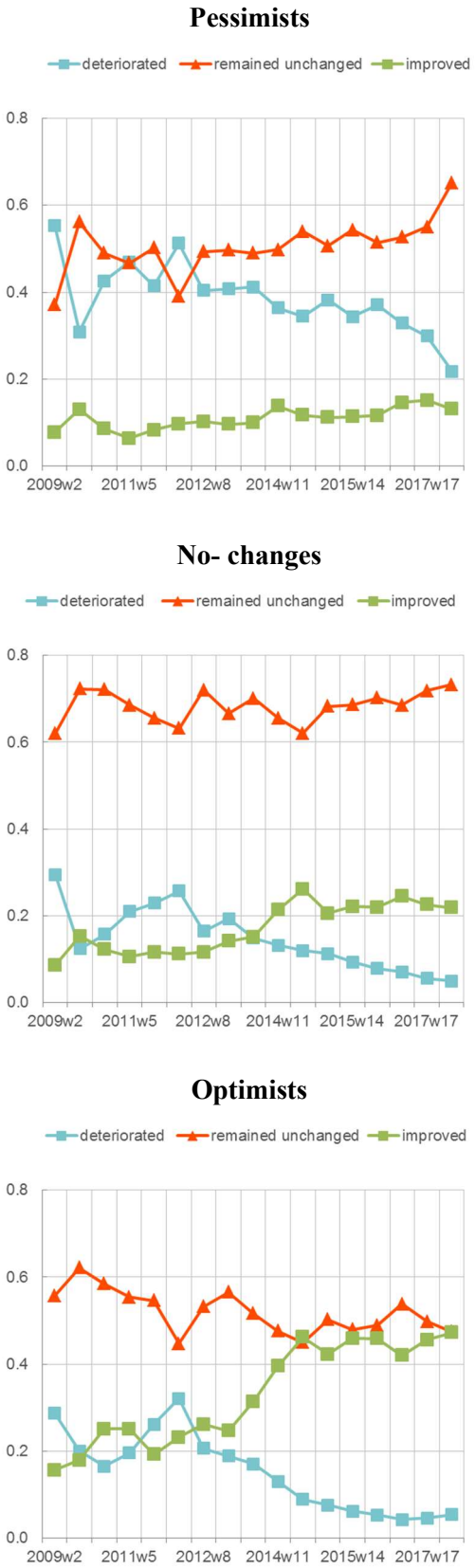
Note: The net percentage is the difference between the percentage of enterprises reporting an increase for a given factor and the percentage reporting a decrease. See Table 1 for variable definitions.

Figure 3: Firms' forecast errors and changes in actual availability of bank loans *(net percentages)*



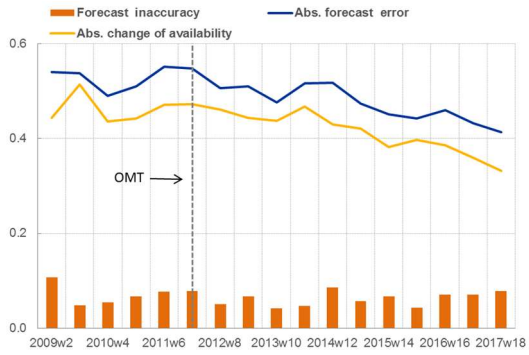
Note: The net percentage is the difference between the percentage of enterprises reporting an increase for a given factor and the percentage reporting a decrease. See Table 1 for variable definitions.

Figure 4: Availability of bank loans given expectations - Pessimists, no-change and optimists



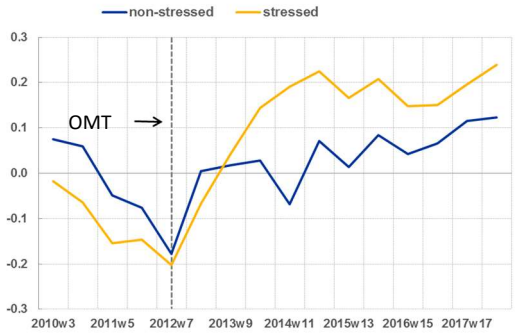
Note: Proportions of firms that report bank availability to improve, to remain unchanged or to deteriorate conditional to their expectations six months before. Pessimists (Optimists) are firms that were expecting a deterioration (improvement); no-changes are firms that were expecting broadly unchanged availability.

Figure 5: Forecast inaccuracy index and its components



Note: See Table 1 for variable definitions.

Figure 6: Firms' expectations of bank loan availability over time- stressed and non-stressed countries *(net percentages)*



Note: The net percentage is the difference between the percentage of enterprises reporting an increase for a given factor and the percentage reporting a decrease. The dummy OMT is equal to 1 in 2012w7. The sample is split between stressed countries (Greece, Ireland, Italy, Spain and Portugal) and non-stressed countries (Austria, Belgium, Germany, Finland, France and the Netherlands). See Table 1 for variable definitions.

11. Appendix

Table A.1: Robustness on expectations: Added lagged dependent variables

VARIABLES	(1) Exp	(2) Exp	(3) Exp	(4) Exp
lagged expectation		0.528***		0.501***
		(0.030)		(0.031)
realisation	0.732***	0.704***	0.717***	0.694***
	(0.036)	(0.037)	(0.037)	(0.037)
lagged realisation	0.124***	0.029	0.121***	0.033
	(0.031)	(0.032)	(0.032)	(0.033)
general economy	0.376***	0.365***	0.342***	0.332***
	(0.027)	(0.027)	(0.028)	(0.028)
lagged general economy	0.042*	-0.001	0.040	0.005
	(0.025)	(0.025)	(0.027)	(0.027)
sales&profit	0.288***	0.275***	0.279***	0.267***
	(0.027)	(0.027)	(0.027)	(0.027)
lagged sales&profit	0.072***	0.039	0.073***	0.044*
	(0.025)	(0.025)	(0.026)	(0.026)
willingness of banks to provide credit	0.521***	0.523***	0.519***	0.522***
	(0.033)	(0.033)	(0.034)	(0.034)
lagged willingness of banks to provide credit	0.022	-0.041	0.045	-0.015
	(0.029)	(0.030)	(0.030)	(0.031)
own capital	0.070**	0.070**	0.100***	0.096***
	(0.028)	(0.029)	(0.029)	(0.030)
lagged own capital	-0.020	-0.036	0.006	-0.011
	(0.027)	(0.028)	(0.028)	(0.029)
credit history	0.129***	0.130***	0.145***	0.145***
	(0.029)	(0.030)	(0.030)	(0.030)
lagged credit history	-0.022	-0.023	0.002	-0.004
	(0.027)	(0.028)	(0.028)	(0.029)
/cut1	2.744***	3.185***	3.303***	3.790***
	(0.087)	(0.089)	(0.444)	(0.456)
/cut2	6.322***	6.821***	6.932***	7.472***
	(0.103)	(0.107)	(0.448)	(0.460)
Observations	22,228	21,784	21,977	21,543
Firm controls	No	No	Yes	Yes
Industry FE	No	No	Yes	Yes
Country*Wave Dummy	No	No	Yes	Yes
VCE_Cluster	Permid	Permid	Permid	Permid
Pseudo R-squared	0.145	0.155	0.155	0.169

Note: This table presents estimates of expectations on the availability of bank loans with added lagged independent variables. Columns 1 and 2 show estimated without controls. Firm controls are *size*, *age*, *family-owned* and *autonomous*. The model is estimated using ordered logit. The estimation period is June 2009 –March 2018. See Table 1 for variable definitions. All regressions include fixed effects as specified. Standard errors clustered at the firm level appear in parentheses. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table A.2: Robustness on expectations: Different estimation models

VARIABLES	(1) ologit	(2) ols	(3) gologit *Exp = 0*	(4) gologit *Exp = 1*
realisation	0.726***	0.184***	0.935***	0.535***
	(0.018)	(0.005)	(0.026)	(0.022)
general economy	0.317***	0.084***	0.476***	0.222***
	(0.014)	(0.004)	(0.020)	(0.016)
sales&profit	0.329***	0.087***	0.331***	0.331***
	(0.014)	(0.004)	(0.014)	(0.014)
willingness of banks to provide credit	0.541***	0.139***	0.802***	0.354***
	(0.017)	(0.004)	(0.025)	(0.020)
capital	0.094***	0.024***	0.085***	0.085***
	(0.014)	(0.004)	(0.014)	(0.014)
credit history	0.131***	0.035***	0.045**	0.233***
	(0.015)	(0.004)	(0.020)	(0.019)
/cut1	2.018***			
	(0.365)			
/cut2	5.532***			
	(0.366)			
Constant		1.030***	-2.894***	-4.621***
		(0.096)	(0.334)	(0.334)
Observations	83,303	83,303	83,303	83,303
Firm controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
VCE Cluster	Permid	Permid	Permid	Permid
Pseudo R-squared ♣	0.140	0.233	0.152	0.152

Note: This table presents estimates of expectations on the availability of bank loans by different econometric estimation models. Column 1 presents the baseline model of expectations, estimated by ordered logit, column 2 by ordinary least squares and column 3 and 4 by generalised ordered logit, with *expectation* =-1 as reference category. The estimation period is June 2009 –March 2018. See Table 1 for variable definitions. All regressions include fixed effects as specified. Standard errors clustered at the firm level appear in parentheses. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level. ♣ R-squared for OLS.

Table A3: Non-conventional monetary policy and expectations on the availability of bank loans: Falsification tests

	Medium large firms		Use of bank loans	
	(1)	(2)	(3)	(4)
VARIABLES	Pre-OMT	Post-OMT	Pre-OMT	Post-OMT
medium-large	0.019	0.026		
	(0.017)	(0.017)		
medium-large X pre-OMT	0.049			
	(0.072)			
medium-large X post-OMT		-0.097		
		(0.068)		
use of bank loans			-0.111***	-0.108***
			(0.016)	(0.016)
use of bank loans X pre-OMT			0.115	
			(0.070)	
use of bank loans X post-OMT				0.051
				(0.066)
/cut1	2.130***	2.133***	1.952***	1.955***
	(0.362)	(0.362)	(0.366)	(0.366)
/cut2	5.643***	5.645***	5.467***	5.469***
	(0.363)	(0.363)	(0.367)	(0.367)
Observations	84,588	84,588	82,968	82,968
Business conditions	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Country*Wave Dummy	Yes	Yes	Yes	Yes
VCE_Cluster	Permid	Permid	Permid	Permid
Pseudo R-squared	0.143	0.143	0.144	0.144

Note: This table presents difference in differences on the expectations on the availability of bank loans, where the use of bank loans and a dummy for medium and large firms are interacted with a pre and post-OMT dummy. The dummy pre-OMT is equal 1 six months before (2011w6) and the dummy post-OMT (2012w8) six months after the announcement of the OMT program. The model is estimated using ordered logit. The estimation period is June 2009 –March 2018. All regressions include fixed effects as specified. Standard errors clustered at the firm level appear in parentheses. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table A4: Non-conventional monetary policy and expectations on the availability of bank loans across stressed and non-stressed firms: Falsification tests

	STRESSED COUNTRIES				NON-STRESSED COUNTRIES			
	Medium large firms		Use of bank loans		Medium large firms		Use of bank loans	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Pre-OMT	Post-OMT	Pre-OMT	Post-OMT	Pre-OMT	Post-OMT	Pre-OMT	Post-OMT
medium large X pre-OMT	0.066				0.028			
	(0.103)				(0.100)			
medium large	-0.002	-0.001			0.031	0.044*		
	(0.026)	(0.026)			(0.024)	(0.024)		
medium large X post-OMT		0.029				-0.248***		
		(0.095)				(0.096)		
use of bank loans			-0.042*	-0.041*			-0.179***	-0.172***
			(0.023)	(0.023)			(0.022)	(0.022)
use of bank loans X pre-OMT			0.055				0.170*	
			(0.101)				(0.099)	
use of bank loans X post-OMT				0.042				0.046
				(0.092)				(0.096)
/cut1	1.891***	1.891***	1.727***	1.727***	2.172***	2.175***	1.943***	1.949***
	(0.128)	(0.128)	(0.170)	(0.170)	(0.383)	(0.383)	(0.388)	(0.388)
/cut2	5.208***	5.209***	5.042***	5.042***	5.867***	5.871***	5.647***	5.653***
	(0.133)	(0.132)	(0.173)	(0.173)	(0.385)	(0.385)	(0.390)	(0.390)
Observations	40,520	40,520	39,767	39,767	44,068	44,068	43,201	43,201
Business conditions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country*Wave Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VCE_Cluster	Permid	Permid	Permid	Permid	Permid	Permid	Permid	Permid
Pseudo R-squared	0.151	0.151	0.152	0.152	0.134	0.134	0.135	0.135

Note: This table presents difference in differences on the expectations on the availability of bank loans, where the use of bank loans and a dummy for medium and large firms are interacted with a pre and post-OMT dummy. The dummy pre-OMT is equal 1 six months before (2011w6) and the dummy post-OMT (2012w8) six months after the announcement of the OMT program. The sample is split between stressed countries (Greece, Ireland, Italy, Spain and Portugal) and non-stressed countries (Austria, Belgium, Germany, Finland, France and the Netherlands). The model is estimated using ordered logit. The estimation period is June 2009 –March 2018. All regressions include fixed effects as specified. Standard errors clustered at the firm level appear in parentheses. *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.