Firm Expectations and News: Micro v Macro*

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Abstract

To shed light on the expectation formation of firms, we use firm-level data and examine how expectations adjust to news. We classify news as either micro (firm-specific developments) or macro (information about the aggregate economy). Analyzing survey data from Italian and German firms, we consistently find that expectations overreact to micro news but underreact to macro news. Our empirical specification is based on a stylized model of 'island illusion,' because of which firms systematically underestimate the importance of aggregate developments for their own performance. This illusion has aggregate implications, which we derive by embedding it into the canonical noisy-information model.

Keywords: Survey data, overreaction, underreaction, micro news, macro news, island illusion, inflation, business cycle

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1 Introduction

In theory, firms act in a forward-looking manner as they decide about production, investment and hiring as well as on prices (Lucas 1972; Kydland and Prescott 1982; Woodford 2003; Jaimovich and Rebelo 2009; Mortensen and Pissarides 2009). And yet, at an empirical level, little is known about how firms form expectations. A fundamental question for both theory and policy is what type of economic information is reflected in firm expectations and to what extent. In this paper, we analyze survey data to assess in detail how firm expectations adjust to news. We leverage earlier work on professional forecasters by Coibion and Gorodnichenko (2015) and link forecast errors to forecast revisions as a measure of news perceived by firms, but zoom in on expectations about firm-level outcomes—the ultimate concern of firms—and allow them to be affected differently by micro and macro news. These news represent information about firm-specific developments and the aggregate economy, respectively.

Our empirical specification is microfounded in a stylized general-equilibrium model where firm expectations take center stage. Information is noisy and expectations are not necessarily rational: firms may suffer from 'island illusion,' meaning they systematically underestimate the importance of aggregate developments for their own performance. The departure from rational expectations is governed by a single parameter that jointly restricts the impact of micro and macro news: firm expectations overreact to micro news and underreact to macro news under island illusion; they do neither under rational expectations.

Our analysis uses data from two firm surveys: The Banca d'Italia's 'Survey on Inflation and Growth Expectations' (SIGE) of Italian firms and the German 'ifo Business Climate Survey,' or ifo survey for short. They differ along many dimensions, including how answers are solicited, the time frequency, and even the variables of interest. Yet, we find robustly across all specifications that firm expectations overreact to micro news and underreact to macro news. Also, the extent of overreaction and underreaction co-moves positively both over time and across firms—just like the model would have it assuming there is island illusion. Island illusion also has aggregate implications: We establish this as we embed it in the noisy information model of Lorenzoni (2009) and calibrate it to match the survey evidence.

More in detail, we relate firms' forecast errors about firm-level outcomes to news as processed by firms in real time, measured as forecast revision across survey rounds. These revisions may reflect both micro and macro news. We isolate the effect of the micro component by controlling for macro news. The SIGE is particularly suited for our analysis because it solicits firms' expectations about their own prices but also their inflation expectations, based on which we compile macro news. The ifo survey, in turn, offers longer time series than the SIGE, particularly at the level of individual firms. It also asks firms about their production expectations but does not regularly inquire about their macroeconomic expectations. However, the ifo survey also provides the basis for the ifo *Business Climate Index*, an aggregate indicator of the German business cycle. It is widely watched, including by professional forecasters. And indeed, firms expectations about the macroeconomy have been shown to align well with those of professional forecasters (Link et al. 2023). Hence, to measure macro news, we may resort to the surprise component of the index relative to the corresponding consensus forecast of professional forecasters. Importantly, in both surveys, the responses are confidential, and the weight of individual responses is sufficiently small for strategic motives not to matter (Gemmi and Valchev 2023).

Our main result emerges robustly across both surveys: Firm expectations overreact to micro news and underreact to macro news. Positive macro news, or new information about the overall economy, tends to lead to positive forecast errors, meaning that actual outcomes exceed expectations. More concretely, if firms revise inflation expectations upwards, their own prices down the road will be even higher than expected. Or, if the current ifo index surprises positively, a firm's production will likely exceed its expectation. In this sense, firm expectations do not fully account for macro news as it becomes available: they underreact to macro news. Micro news, instead, has a negative effect on the forecast error: an upward revision of expectations tends to be followed by a lower-than-expected realization. Put differently, firm expectations respond too strongly to micro news, they overreact. These patterns are not only a distinct feature of both data sets but also emerge robustly for alternative definitions and across various specifications. Moreover, underreaction and overreaction have persistent effects on expectations, suggesting that they are not caused by measurement error that might otherwise partially rationalize overreaction (Juodis and Kučinskas 2023; Liao 2024).

Our baseline specifications pool firm-level observations for, in turn, the SIGE and the ifo survey. For the ifo survey, we also estimate the reaction to news for individual firms, taking advantage of the large number of consecutive observations available for most firms. It turns out that individual firms do not differ much in their overreaction to micro news, but the response to macro news is more dispersed. Most firms underreact, but how strongly depends on firm characteristics. Larger firms, for instance, underreact more strongly. This result may reflect a stronger impact of the macroeconomy on the production—and hence the forecast errors—of larger firms.

We also detect a pattern in the cross-section: Firms that tend to strongly overreact to micro news also tend to strongly underreact to macro news, as predicted by island illusion. Likewise, when we allow estimates to vary over time, we find that periods of strong underreaction to macro news are also periods of strong overreaction to micro news, and vice versa. Finally, we establish that the variation in the reaction to news across firms is systematically correlated with firm-level outcomes. In particular, we find that a stronger overreaction to micro news is associated with lower profits, and both overreaction to micro news and underreaction to macro news are associated with higher firm-level production and forecast-error volatility—consistent with previous work showing that firm expectations matter for firm outcomes (Bachmann et al. 2013; Enders et al. 2022).

Our results are consistent with island illusion that we embed in the canonical noisy-information model of Lorenzoni (2009); first, in a stylized manner, to offer a microfoundation of our empirical specification, and later to explore the aggregate implications of island illusion. In this context, island illusion means that firms *systematically* underestimate the weight of the aggregate component in the signals that help them to learn about the state of the economy—hence, the departure from rational expectations.[1] More broadly, island illusion is an instance of salience, which Taylor and Thompson (1982) define as "the phenomenon that when one's attention is differentially directed to one portion of the environment rather than to others, the information contained in that portion will receive disproportionate weighing in subsequent judgments" and which has been shown to bias inference in various contexts (Bordalo et al. 2022, 2023).[2]

[1] This is consistent with the findings of Konchitchki and Xie (2023). Using financial reports, they show that corporate managers pay insufficient attention to inflation risk.

[2] Bianchi et al. (2022) use a machine-learning algorithm to estimate time-varying systematic expec-

As we embed island illusion in the full Lorenzoni model, we first run a Monte Carlo exercise: using simulated data to estimate our empirical specification, we obtain both overreaction to micro news and underreaction to macro news, just like in the data. In the process, we calibrate the extent of island illusion in the model via an indirect inference procedure. Finally, we use the model to show that island illusion alters aggregate dynamics in response to a productivity shock—aligning them more closely with the time-series evidence put forward in the classic study by Galí (1999).

The rest of the paper is organized as follows. In the remainder of the introduction, we place the paper's contribution in the context of the literature. Section 2 introduces our empirical framework alongside a model-based microfoundation. Sections 3 and 4 introduce the SIGE and ifo surveys and present results for price and production expectations, respectively. In Section 5, we perform a brief model-based assessment of the aggregate implications of island illusion. The conclusion outlines potential venues for future research.

Related Literature. First, at an empirical level, our work relates to the literature which is concerned with macroeconomic expectations of firms; see, for instance, Coibion et al. (2020), Andrade et al. (2022), Kumar et al. (2023), and Savignac et al. (2024), as well as the recent survey article by Candia et al. (2023). In contrast, our focus is on firms' expectations about their own performance. Here, only a limited number of studies have analyzed firm expectations about firm outcomes (see Born et al. 2023). Massenot and Pettinicchi (2018) and Barrero (2022) document 'over-extrapolation' for firm expectations based on the ifo survey and for U.S. managers, respectively, meaning that firm-level performance (rather than forecast revisions) predicts forecast errors. Enders et al. (2019), in turn, take a macro perspective and document that the response of firm expectations to monetary policy shocks is non-linear in the shock size. Neither of these studies distinguishes between the response to micro and macro news.

Second, our empirical specification extends the framework popularized by Coibion and Gorodnichenko (2015); see Born et al. (2024) for a survey. Coibion and Gorod-

tational errors and find that survey respondents place too much weight on the private or judgmental component of their forecasts and too little weight on publicly available economic information. Also, at a more general level, direct experience has been found to impact (risk) perceptions more strongly than outcomes experienced by others (Smith et al. 2001; Viscusi and Zeckhauser 2015).

nichenko (2015) find for the *consensus* forecast of professional forecasters that forecast revisions predict forecast errors. This conflicts with the full information rational expectations benchmark but not necessarily with rational expectations because the consensus forecast is not available to individual forecasters in real time. Bordalo et al. (2020) show that forecast revisions predict forecast errors also *at the level of individual forecasters*.[3] As such they reject rational expectations but not rationality *per se*: Predictable forecast errors may emerge because of forecasters' asymmetric loss function, specific constraints on information processing, or in a learning environment with parameter uncertainty (e.g., Elliott et al. 2008; Bachmann et al. 2023; Farmer et al. 2023; Kohlhas and Robertson 2024).[4]

Lastly, our paper relates to theoretical work that accounts for behavioral aspects in expectation formation.[5] Models of *level-K thinking*, *cognitive discounting* and *sticky expectations* can rationalize why there is underreaction to current news (e.g., Bouchaud et al. 2019; Farhi and Werning 2019; García-Schmidt and Woodford 2019; Carroll et al. 2020; Gabaix 2020), while *constrained memory* may account for overreaction (Azeredo da Silveira and Woodford 2019). Ba et al. (2023) show that bounded rationality at various stages of belief formation can lead to both over- and underreaction. Potentially unrepresentative media reporting or, more broadly, *narratives* may also distort the expectation formation process (Shiller 2017; Chahrour et al. 2021; Andre et al. 2024). Our model of island illusion is conceptually closely related to *diagnostic expectations* and *overconfidence* (Bordalo et al. 2019, 2020; Bianchi et al. 2024b; Broer and Kohlhas 2024). It differs from these approaches in simultaneously accounting for under- and overreactions in a general-equilibrium setting.

[3] In fact, the consensus forecast underreacts to news, while individual forecasters overreact to news. See also Angeletos et al. (2021), Kučinskas and Peters (2022), Afrouzi et al. (2023), and Broer and Kohlhas (2024) for evidence on the reaction to news of households, professional forecasters, or participants of experiments.

[4] However, we stress that models that abandon the full information assumption in favor of noisy information still predict that forecast errors should not be predictable at the level of individual forecasters (Bordalo et al. 2020). This includes models of rational inattention (e.g., Mackowiak and Wiederholt 2009). Kohlhas and Walther (2021) put forward a model of asymmetric attention which rationalizes the observation that forecasts of output growth underreact to *average* forecast revisions (news) but overreact to recent realizations of output growth. They stress that asymmetric attention may arise in a fully rational framework.

[5] Under certain conditions, behavioral models and incomplete information models give rise to equivalent equilibrium effects (Angeletos and Huo 2021).

2 Framework

This section presents our empirical framework, placing it in the context of earlier work. It also offers a microfoundation based on a stylized general-equilibrium model where firm expectations are subject to ‘island illusion.’

2.1 Baseline specification

Our empirical analysis extends the approach of Coibion and Gorodnichenko (2015), CG for short, and related studies in two ways. First, we consider firm expectations of firm-level outcomes: either a firm’s production or its price. Second, as we study the impact of news on expectations, we distinguish between different *types* of news: Firm expectations about firm-level outcomes may respond to a) news about firm-specific developments, that is, ‘micro news’ and b) news about relevant macro variables, that is, ‘macro news.’[6]

To measure micro news, we rely on firms’ forecast revisions about firm-level outcomes because forecast revisions reflect the reaction to available news (Bordalo et al. 2020). Of course, such revisions may reflect both micro news and macro news. To isolate micro news, we pursue two alternative strategies. First, we explicitly control for macro news in the empirical analysis. Second, we purge forecast revisions of a macro component before the estimation. Specifically, in this case, we measure micro news as the residual of firm-level regressions, which relate forecast revisions to changes in relevant macro variables observable to firms in real time. To measure macro news about inflation and the business cycle, we use firms’ forecast revisions about macro variables (whenever they are available). Alternatively, we rely on the surprise component of relevant macro variables, measured relative to the consensus forecast.[7] We provide more details on the construction of these variables as we turn to the data in the following sections.

[6]Broer and Kohlhas (2024) study systematically how professional forecasters respond to various real-time indicators, including macroeconomic variables. They do not, however, focus on the distinction between micro and macro news, as we do below.

[7]Surprises are measured relative to a firm’s information set, e.g., in period t, we subtract from the indicator release at the end of period $t-1$ the corresponding consensus forecast.

Our empirical analysis is centered around the following specification (baseline):

$$x_{t+h,t}^i - \mathrm{F}_t^i(x_{t+h,t}^i) = \beta_0 + \beta_1 \cdot \text{micro news}_t^i + \beta_2 \cdot \text{macro news}_t^i + v_t^i \ . \tag{1}$$

Here, $x_{t+h,t}^i - \mathrm{F}_t^i(x_{t+h,t}^i)$ is the forecast error of firm i made at time t regarding firm-level outcome x_{t+h}^i, which is either production or prices, depending on the specification. In what follows, we refer to β_1 as the 'micro coefficient' and β_2 as the 'macro coefficient': under rational expectations, these coefficients are zero—independently of whether there are information frictions or not—because micro and macro news are part of a firm's information set.[8]

Specification (1) is not simply a test of rational expectations. It also points towards specific alternative models of expectation formation. When positive news ($\text{news}_t > 0$) tends to be followed by positive forecast errors ($\beta > 0$), the forecast revision turns out to be too weak from an ex-post point of view. Hence, there is underreaction to news. Conversely, when positive news is, on average, followed by negative forecast errors ($\beta < 0$), the forecast revision is too strong from an ex-post point of view: There is overreaction to news (Bordalo et al. 2020). Section 2.2 develops a stylized general-equilibrium model, providing a microfoundation to Specification (1). It also establishes conditions under which β_1 and β_2 indeed differ from zero.

Before that, we take up a potential complication. In principle, measurement error may mechanically induce a negative correlation between the forecast revision and the forecast error, a concern raised by Juodis and Kučinskas (2023) and Liao (2024).[9] To see this, consider the possibility that firms do not report their actual expectations but, for whatever reason, deviate from the true value when reporting their expectations

[8]Coibion and Gorodnichenko (2015) estimate a version of Specification (1) on the median (consensus) professional forecast for inflation and find a positive coefficient. This result is still consistent with rational expectations: It may simply reflect a failure of the full-information assumption. Intuitively, by estimating the specification on the consensus forecast, the econometrician uses information not available to the individual forecaster. Instead, if Specification (1) is estimated on data for individual forecasters, rational expectations imply that forecast errors are not predictable by $news_t$ that forecasters observe in real time—independently of whether there is otherwise full information or not. Bordalo et al. (2020) estimate a version of Specification (1) at the forecaster level using a single news measure and find a negative coefficient, rejecting rational expectations.

[9]Hence, measurement error may explain some of the overreaction; in case of professional forecasters around one half according to the estimates of Juodis and Kučinskas (2023).

in the survey. Formally, let $\varepsilon_t^{i,rep.}$ denote some i.i.d. measurement error. Reported expectations are then given by $\mathrm{F}_t^{i,rep.}(x_{t+h,t}^i) = \mathrm{F}_t^i(x_{t+h,t}^i) + \varepsilon_t^{i,rep.}$. The observed forecast error, $x_{t+h,t}^i - \mathrm{F}_t^i(x_{t+h,t}^i) - \varepsilon_t^{i,rep.}$, is then by construction *negatively* correlated with the reported forecast revision: $FR_t^{i,rep.} = FR_t^i + \varepsilon_t^{i,rep.} - \varepsilon_{t-1}^{i,rep.}$.

Hence, in principle, measurement error offers an explanation for overreaction. In our empirical analysis, we do not find overreaction in response to macro news, but in response to micro news. To rule out that this result merely reflects measurement error, we consider a number of alternative specifications. First, we consider a dynamic version of Specification (1) which relates forecast errors to concurrent and *lagged* news, including p lags for both micro and macro news:

$$x_{t+h,t}^i - \mathrm{F}_t^i(x_{t+h,t}^i) = \beta_0 + \sum_{\rho=0}^{p}(\beta_{1,\rho} \cdot \text{micro news}_{t-\rho}^i + \beta_{2,\rho} \cdot \text{macro news}_{t-\rho}^i) + v_t^i \ . \quad (2)$$

If there is an overreaction not only to concurrent but also to lagged news ($\beta_{1,\rho} < 0$ for $\rho > 0$), it is unlikely to be caused by measurement error: As our derivation above shows, measurement error in lagged news is not correlated with the forecast error made at time t. In principle, if measurement error were positively autocorrelated over some periods, lagged news may still cause the time-t forecast error. However, prolonged periods of forecast revisions in a specific direction are unlikely to reflect measurement error, but rather actual expectations. As a second robustness check, we simply exclude outliers, which are especially prone to measurement error.

2.2 Microfoundations

We develop a stylized general-equilibrium model of firm expectations tailored to illustrate how expectations about firm-level outcomes depend on micro and macro news. This perspective distinguishes the model from earlier work by Bordalo et al. (2020) and Broer and Kohlhas (2024). We propose a particularly simple departure from rational expectations that allows us to map the model solution into Specification (1) in which aggregate and idiosyncratic developments impact firms' production and pricing decisions. This departure is captured by a single parameter, which, in turn, represents the degree of island illusion and imposes joint constraints on β_1 and β_2. In the following, we keep the exposition brief and delegate details to the appendix.

2.2.1 Model outline

There is a continuum of islands indexed by $i \in [0, 1]$, each populated by a representative firm. Firms operate under monopolistic competition and manufacture differentiated goods based on island-specific productivity, simultaneously driven by an aggregate component and an island-specific component, as in Lorenzoni (2009). Firms adjust production to meet the demand that arises at pre-set prices. A representative household buys from and supplies labor at the pre-set nominal wage to all firms.

The timing of events is as follows: firms start with expectations about their own output, which will depend on their price relative to the aggregate price index.[10] Next, firms observe their own productivity but not the underlying components. They also receive a public signal about the aggregate price index that is noisy but correlates with aggregate productivity (macro news). These observations might prompt firms to revise their output forecasts. Once they have set prices, demand materializes and firms produce. A firm's forecast error is actual output minus the level of output expected by the same firm after receiving the news. Below, we evaluate firm expectations and relate them to forecast revisions and news according to Specification (1). Time subscripts are omitted for simplicity.

More in detail, production Y^i is linear in productivity A^i and labor L^i: $Y^i = A^i L^i$. Demand, in turn, is given by $Y^i = (P^i/P)^{-\gamma} M/P$, where $\gamma > 1$ is the elasticity of substitution between differentiated goods, P is the aggregate price index, and $M > 0$ is constant nominal demand. Using small letters to denote logs, productivity is the sum of the aggregate component ε and the island-specific component η^i: $a^i = \varepsilon + \eta^i$. Both components are i.i.d. random variables with mean zero, variances σ_ε^2 and σ_η^2, and the cross-island average of η^i is zero.

Productivity on island i matters not only for production. It is also a signal about the aggregate component that, in equilibrium, is inversely related to the aggregate price level and, hence, determines a firm's relative price, $p^i - p$. Formally, ignoring constants in what follows, we have $p = -\varepsilon$. In addition to their own productivity, firms receive a noisy signal of the aggregate price index, that is, macro news: $s = p + e = -\varepsilon + e$. The noise term e has variance σ_e^2.[11]

[10] For simplicity, we consider firms' level forecasts of output. Since the earlier realizations are known, this comes without loss of generality.

[11] Instead of receiving a signal about aggregate prices, one can also assume that the signal reflects a

2.2.2 Island illusion

As we turn to expectation formation, we further simplify the model and assume $\mathrm{Var}(a^i) = \mathrm{Var}(s)$.[12] The parameter ω measures the weight of the idiosyncratic component in firm-level productivity such that $\sigma_\eta^2 = \omega \,\mathrm{Var}(a^i)$. This implies $\sigma_\varepsilon^2 = (1-\omega)\,\mathrm{Var}(a^i)$ and, given our simplifying assumption, $\sigma_e^2 = \omega \,\mathrm{Var}(s)$.[13] The weight of the aggregate component perceived by firms potentially differs from the actual weight $1-\omega$ and is given by $1-\omega\Upsilon$. Under rational expectations: $\Upsilon = 1$. Values of $\Upsilon \geq 1$ capture island illusion, meaning the *perceived weight* (and the perceived value of σ_ε^2) is smaller than the actual weight. As firms correctly observe the sum of both components and its variance $\mathrm{Var}(a^i)$, the perceived weight of the idiosyncratic (aggregate) component, $\omega\Upsilon$ $(1-\omega\Upsilon)$, is greater (smaller) than its actual value ω $(1-\omega)$. Firms also observe the signal and its variance, such that the underestimation of $\mathrm{Var}(\varepsilon)$ implies an overestimation of the importance of noise, $\mathrm{Var}(e)$, in the signal. Island illusion hence leads to biased interpretations of both signals, a^i and s. Υ is bounded from above by $1/\omega$. The solution for a firm's expectation of the aggregate price level, that is, its forecast, is then given by (see Appendix A.1.2):

$$\mathrm{F}^i(p) = \frac{1-\omega\Upsilon}{2-\omega\Upsilon} s - \frac{1-\omega\Upsilon}{2-\omega\Upsilon} a^i \; . \tag{3}$$

Intuitively, expectations about the aggregate price level decline in a firm's own productivity a^i and rise in the signal s about the aggregate price level. After a decrease in a^i, firms expect overall technology to have fallen, causing the price level to rise. Similarly, a higher s directly signals an elevated price level. This holds for rational expectations ($\Upsilon = 1$) and in the case of island illusion ($\Upsilon > 1$).

In the latter case, however, firms think of changes in a^i as more idiosyncratic (or island-specific) than they actually are, dampening their impact on the expectations of

noisy measure of aggregate production, corresponding to our analysis in Section 4. We have verified that a model version featuring demand shocks has the same predictions as the version presented here.

[12] In the model, this holds if macro news is published by a forecaster which observes productivity on one island and makes this information public so that firms effectively observe two technology draws: their own and that of one competitor. In Appendix A.1.3, we relax the assumption $\mathrm{Var}(a^i) = \mathrm{Var}(s)$ and establish a (fairly mild) condition for our main result to go through.

[13] Since $a^i = \varepsilon + \eta^i$, we can write $\mathrm{Var}(a^i) = \mathrm{Var}(\varepsilon) + \mathrm{Var}(\eta^i)$ or $\mathrm{Var}(a^i) = (1-\omega)\,\mathrm{Var}(a^i) + \omega\,\mathrm{Var}(a^i)$. Since $s = -\varepsilon + e$, we also have $Var(s) = \mathrm{Var}(\varepsilon) + \mathrm{Var}(e)$ or $Var(s) = (1-\omega)\,\mathrm{Var}(s) + \omega\,\mathrm{Var}(s)$.

aggregate prices. For a given signal volatility $Var(s)$, island illusion also reduces the perceived signal-to-noise ratio of s, as its volatility $Var(s)$ is known but its informational content, given by σ_ε^2, is thought to be lower than it actually is. Under island illusion, firms, therefore, react less to both signals than under rational expectations. As a result, the aggregate price index—and, hence, own sales—will, on average, be higher (lower) than expected, given $s > 0$ ($a_i > 0$).

Put differently, firms make systematic forecast errors in response to signals. Note, however, that firms do not err about the variances of s and a^i; they simply misjudge the relative importance of the driving forces.[14] Moreover, the implied probability distribution cannot be rejected based on a finite number of draws from the data-generating process—an instance of near-rational expectations (Woodford 2010).[15]

Formally, the forecast error of firm i is the difference between actual output, y^i, and the firm forecast conditional on productivity and macro news $\mathrm{F}^i(y^i|a^i, s)$. The forecast revision is the change in the forecast upon observing these signals relative to the initial expectation $\mathrm{F}_0^i(y^i)$, which is based on the commonly known pre-shock value of aggregate technology: $FR^i = \mathrm{F}^i(y^i|a^i, s) - \mathrm{F}_0^i(y^i)$. Armed with these definitions, we state our main result (derived in Appendix A.1.3):

Proposition 1. *Consider the regression*

$$y^i - \mathrm{F}^i(y^i) = \beta_1 FR^i + \beta_2 s + v^i \ , \tag{4}$$

where all terms are defined as introduced above, and v^i represents a potential error term. In the case of island illusion, that is, for $\Upsilon > 1$, we obtain

$$\beta_1 < 0 \qquad \textit{and} \qquad \beta_2 > 0 \ .$$

Furthermore, a higher degree of island illusion (a higher Υ) implies larger absolute values of β_1 and β_2. For $\Upsilon = 1$, we obtain $\beta_1 = \beta_2 = 0$ (rational expectations).

[14] Note that island illusion does not lead to unconditionally biased expectations but an underestimation of future output volatility (which depends on the underestimated volatility of ε). Both predictions are consistent with evidence established by Barrero (2022) based on a survey of managers.

[15] In this framework, placing an upper bound on the relative entropy (a measure of the discrepancy) between firms' subjective and objective conditional probabilities implies an upper bound for Υ, given the remaining parameter values.

Equation (4) is the counterpart to our baseline Specification (1) and Proposition 1 establishes stringent cross-parameter restrictions on a possible deviation from rational expectations. With island illusion, the model predicts a simultaneous overreaction to private signals, as reflected in the forecast revision FR^i net of the public signal s, and an underreaction to public information by individual firms—based on a single parameter that captures the departure from rational expectations.[16]

With respect to variations in structural parameters, we obtain the following:

Corollary 1. *More competition, i.e., a higher γ, increases the value of β_2 under island illusion.*

As aggregate variables, such as competitors' prices, become more important to firm-level outcomes under greater competitive pressure, misjudging these variables leads to larger forecast errors.

We obtain Proposition 1 / Corollary 1 by considering three stages of the information flow—forecast, news/forecast revision, production—in a single period, simplifying notation. In Section 5, we incorporate island illusion into a multi-period business cycle model. In this context, information flows across periods, and thus island illusion, affects how news impacts intertemporal forecast errors, consistent with Specification (1).

2.2.3 Model extension: From production to price expectations

A relation isomorphic to Proposition 1 emerges for firms' price expectations once we consider a simple model extension. In particular, assume that firms operate over multiple periods. Furthermore, assume that the aggregate component of technology follows a random walk while the idiosyncratic component is white noise (Lorenzoni 2009). Because of the latter, firms expect to re-adjust prices as soon as they can (at the beginning of the next period) to align them with the long-run technology level. Given that they overestimate (underestimate) the distance between their own and aggregate technology in response to a^i (s), they also overestimate (underestimate) their future price adjustment. In this way, the model can also rationalize over- and underreaction of price expectations to micro and macro news. Appendix A.1.4 provides more details.

[16]The same holds true if FR^i and s are included separately.

3 Price expectations

In this section, we estimate our empirical specification on data for price expectations elicited in a survey of Italian firms. The data is uniquely suited for this purpose since it permits constructing direct measures of micro news and macro news, as processed by firms, and relating them to forecast errors about their own prices. We briefly describe the data before presenting the results.

3.1 The Survey of Inflation and Growth Expectations

The quarterly *Survey of Inflation and Growth Expectations* (SIGE) among Italian firms is run by the Banca d'Italia. It was launched as a panel in 1999 and polls firms in the industrial sector, excluding construction, and non-financial services. The average response rate in the survey is 45 percent.[17] Our sample starts in 2002, when questions about realized changes in firms' own prices were introduced in the survey, and runs up to the end of 2022. Firm responses are generally in the form of growth rates, and the wording of the relevant questions is documented in Panel (a) of Table 1.[18] As a unique feature, firms are asked about expected changes in both their own prices and aggregate inflation, making it possible to measure micro and macro news straightforwardly.

As summarized in Panel (b) of Table 1, to construct forecast errors in quarter t about a firm's price change, we subtract from the realized change reported in period $t+4$ its four-quarters-ahead expectation, as reported in period t. We measure macro news as the first difference of firms' four-quarter-ahead expectations for aggregate inflation across survey rounds. Next, we compute the forecast revision of a firm for its own price: the change in its four-quarters-ahead expectation relative to what it reported in the previous quarter. This is not a direct measure for micro news. As discussed above, forecast revisions may reflect not only micro but also macro news.[19] Hence, we control for macro news as we estimate the impact of forecast revisions on forecast errors. In this way, we can isolate the effect of micro news.

[17] For the comparable Survey of Business Uncertainty in the United States, the response rate is around one-third (Altig et al. 2022).

[18] For further details on the SIGE, see Banca d'Italia (2022) and Grasso and Ropele (2018).

[19] And indeed, we find across a number of specifications that macro news predicts forecast revisions; see the appendix, Table A.3.

Table 1: Survey of Inflation and Growth Expectations

(a) Definition of variables

Label	Name	Wording
$F_t^i(\pi_{t+4,t}^i)$	Exp. change in own prices	For the next 12 months, what do you expect will be the average change in your firm's prices?
$F_t^i(\pi_{t+4,t})$	Exp. inflation (12 months ahead)	In July, consumer price inflation, measured by the 12-month change in the harmonized index of consumer prices, was 8.4 percent in Italy and 8.9 percent in the euro area.[a] What do you think it will be in Italy in September 2023?
$\pi_{t,t-4}^i$	Realized change in own prices	In the last 12 months, what has been the average change in your firm's prices?

(b) Construction of micro news, macro news, and forecast errors

Component	Definition	Alternative/robustness
Micro news	$F_t^i(\pi_{t+4,t}^i) - F_{t-1}^i(\pi_{t-1+4,t-1}^i)$	net of $\gamma_i \Delta\pi_t$
Macro news	$F_t^i(\pi_{t+4,t}) - F_{t-1}^i(\pi_{t-1+4,t-1})$	π_{t-1} – mean forecast$_{t-1}$
Forecast error	$\pi_{t+4,t}^i - F_t^i(\pi_{t+4,t}^i)$	–

Notes: Panel (a): definition of variables and questions in SIGE September 2022 questionnaire. All questions elicit growth rates in percentage points; t denotes quarter of the survey. Since 2009/2010, SIGE features additional questions about firms' inflation expectations six months and two years ahead, which we use to construct fixed-time macro news as robustness exercise. [a]Previous sentence is information treatment that firms generally receive in survey. See Table A.1 for the complete set of questions that we use. Panel (b): definition of variables featured in baseline specification. γ_i indicates firm-specific factor loadings used to purge micro news of their potential macro component, i.e., the most recent change in inflation $\Delta\pi_t$.

For both forecast revisions and macro news, the overlap in forecasting periods is three out of four quarters, which we consider large enough for changes to reflect actual news (rather than changes in the forecast horizon). Still, in our robustness analysis, we consider alternative measures for which there is full overlap. Lastly, we emphasize that we measure forecast revisions, macro news, and forecast errors (all in percentage points) at the level of individual firms based on firms' survey responses.

In our baseline, we winsorize these survey-based variables at the top and bottom one percent to account for potential measurement error. To obtain a consistent sample for the entire analysis, we consider only observations for firms in the survey for at least 20 quarters.[20] When asked about their expectations for aggregate inflation, firms are generally provided with Italy's most recent inflation rate. Since 2012, a randomly selected subset of firms has not received this information. Our baseline sample features only observations for firms that receive the inflation update, but we also assess how much this information treatment matters for our results.

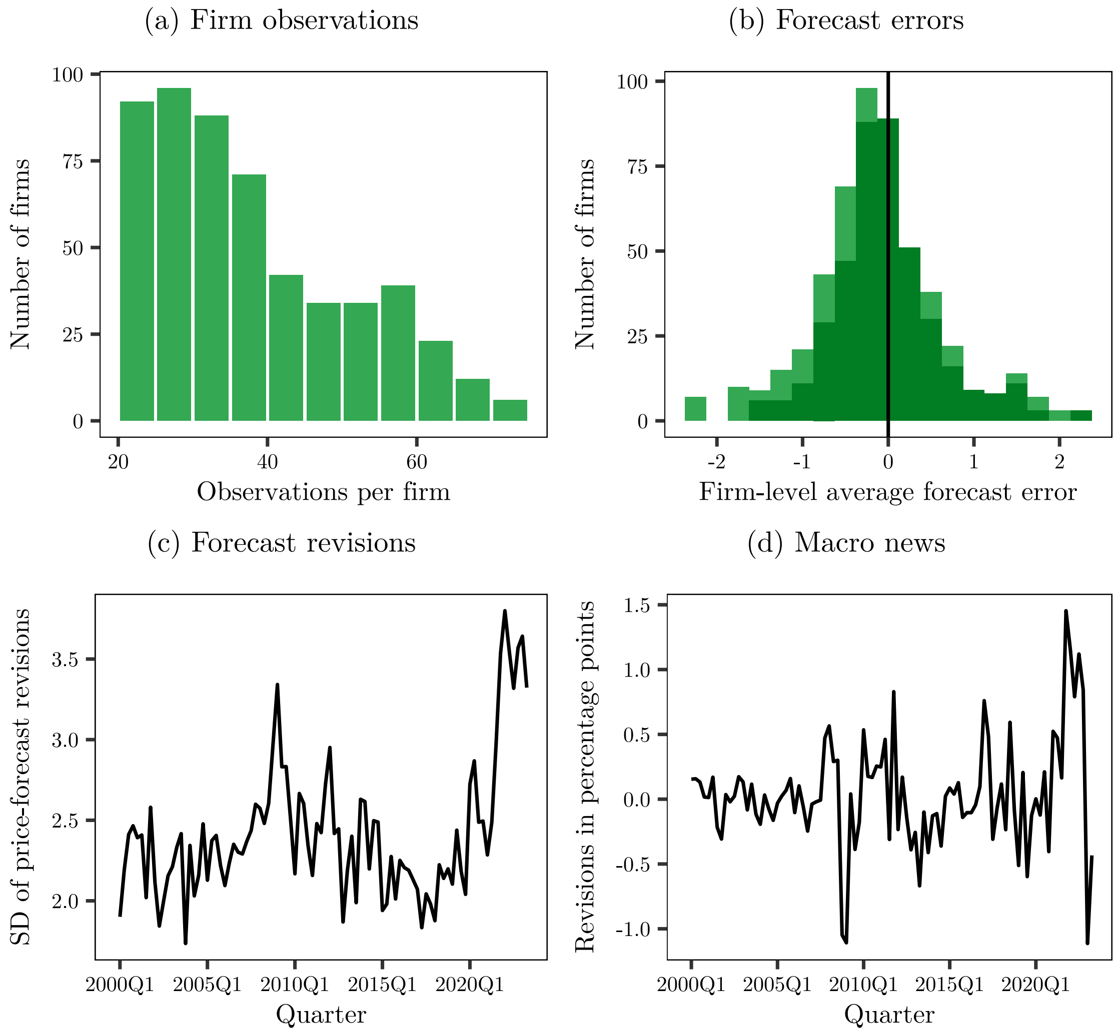
Figure 1 presents descriptive statistics. Panel (a) shows how the number of time-series observations varies across firms. More than 530 firms are in the survey for 20 quarters or more, with some firms in the survey for more than 75 quarters. We plot the distribution of forecast errors in Panel (b). It turns out that expectation errors about firms' own prices are generally (for more than 75% of firms) not significantly different from and centered around zero. This is a general pattern in firm surveys (Born et al. 2023). Panel (c) shows a sizeable dispersion of firms' forecast revisions about their own prices, notably in times of macroeconomic turmoil. Finally, Panel (d) illustrates the evolution of average macro news over the sample period. We observe that firms' revisions of inflation expectations are generally moderate, at least during the low and stable inflation environment through 2020. There are more sizeable revisions as inflation takes off in the post-pandemic period.

3.2 Results for price expectations

We are finally in the position to estimate Specification (1). For this purpose, we pool observations across firms, accounting for firm-fixed effects. Table 2 reports the results. Consider Column (1) first: Both types of news are statistically significant predictors of forecast errors. Hence, we reject rational expectations for firms, consistent with the result of Bordalo et al. (2020) for professional forecasters. On top of that, we find that the type of news is key for *how* expectations fail to meet the rational expectations benchmark: While positive micro news predicts negative forecast errors, positive macro news predicts positive forecast errors. This implies that firms overreact to micro news but underreact to macro news, consistent with our model of island illusion, which restricts the response of expectations to both types of news jointly.

[20]Figure A.1 shows that the resulting sample is representative of all firms in the survey based on their geographic location, number of employees, export orientation, and sector.

Figure 1: Basic statistics for SIGE



Notes: Panel (a): distribution of (quarterly) observations per firm. Panel (b): histogram of firm-level average forecast errors for own prices (after winsorizing). Color indicates if estimates significantly differ from zero at the five percent level (light green) or not (dark green). Bins with less than three firms are not shown due to confidentiality constraints. Panel (c): cross-sectional standard deviation of own-price-forecast revision. Panel (d): macro news as average forecast revision for the one-year-ahead inflation rate.

The estimates are quantitatively important. Consider again Column (1). On average, an *upward* revision of price expectations due to micro news by one percentage point (standard deviation) is followed by a forecast error in the other direction:

Table 2: The response of price expectations to news

	Firms' forecast errors about their own prices				
	(1)	(2)	(3)	(4)	(5)
Micro news					
Forecast rev. for $\pi^i_{t+4,t}$	-0.423^{***}		-0.422^{***}		-0.426^{***}
	(0.018)		(0.031)		(0.018)
Forecast rev. for $\pi^i_{t+4,t}$ net of $\gamma_i \Delta\pi_t$		-0.416^{***}		-0.416^{***}	
		(0.018)		(0.031)	
Forecast rev. for $\pi^i_{t+4,t}$ $\times$ no treatment					-0.064
					(0.046)
Macro news					
Forecast rev. for $\pi_{t+4,t}$	0.275^{***}	0.246^{***}			0.289^{***}
	(0.050)	(0.050)			(0.050)
Inflation surprise			3.059^{***}	2.984^{***}	
			(0.404)	(0.407)	
Forecast rev. for $\pi_{t+4,t}$ $\times$ no treatment					0.305^{***}
					(0.111)
Observations	18,284	18,284	6,640	6,640	21,982
R^2	0.071	0.070	0.074	0.073	0.079
Within R^2	0.080	0.079	0.089	0.089	0.086

Notes: Results are based on Specification (1), relating firms' forecast errors about their own prices to micro news and macro news. Micro news is measured either by forecast revisions while controlling for macro news, or by forecast revisions purged of changes in aggregate inflation. Macro news is measured by firms' forecast revisions about aggregate inflation or by the surprise component of inflation relative to (mean) professional forecast from Consensus Economics. The top and bottom one percent of firms' forecast revisions for their own prices and aggregate inflation and their forecast errors about their own prices are winsorized. Column (5): results for news interacted with a treatment indicator equal to 1 when the survey question does not feature the recent inflation rate and equal to 0 when the survey question does feature the recent inflation rate (baseline). The treatment indicator is also included in the regression. Sample: 2002 (2013 for inflation surprises) to 2022. Firm-fixed effects are always included, standard errors clustered at the firm level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

eventually, prices *fall short* of expectations by 0.423 percentage points (0.27 standard deviations of the forecast error). After an *upward* revision of a firm's expectation of aggregate inflation by one percentage point (standard deviation), a firm's own price *exceeds* expectations by 0.275 percentage points (0.05 standard deviations).[21]

The measures for news in Column (1) are based entirely on survey responses, reflecting the change in the four-quarter ahead expectations for own prices and aggregate inflation, respectively. In Column (2), we show results obtained once we

[21]The standard deviation of micro (macro) news is 2.456 (0.724); that of the forecast error is 3.791.

purge micro news of the most recent change in inflation while allowing for firm-specific loadings, γ_i. In Columns (3) and (4), we vary the measure of macro news, replacing the forecast revision with the inflation surprise relative to the average professional forecast taken from Consensus Economics.[22] Our main result is robust across all specifications: the data never rejects the model's predictions under island illusion.[23] The robustness across the different measures of macro news further suggests that the observed underreaction is not solely due to mistrust in public signals (Broer and Kohlhas 2024), as even managers do not sufficiently incorporate their *own* inflation forecast revisions into their own price forecasts.

The SIGE is the basis for an influential study on firms' inflation expectations by Coibion et al. (2020). For this purpose, the authors exploit that since 2012, the survey no longer provides information about the most recent inflation rate to a randomly selected group of firms (about one-third of all firms).[24] Recall that our baseline estimates are based on the sample of firms that receive the information treatment. To assess the extent to which the treatment matters, we interact news in our regression with an indicator variable that assumes a value of one if a firm receives no information about aggregate inflation in a given forecasting period. Column (5) shows the result: Whether firms are treated or not does not change their response to micro news but to macro news. Firms that receive no inflation update tend to underreact more strongly to macro news. This is consistent with the idea that in the absence of treatment, macro news is less salient and therefore perceived as less relevant to one's own business, suggesting a higher degree of island illusion.

[22]Our specification makes sure that the surprise is in a firm's information set for the relevant survey round. Consider, e.g., the Summer of 2022. On June 13, Consensus Economics polled professional forecasters about their inflation expectations in the second quarter and published results on June 16. The Banca d'Italia published the inflation rate on July 8. The difference between the realized value and the average professional forecast is the measure of macro news that we use for 2022Q3. In this case, the SIGE was conducted between August 25 and September 15. Recall that firms are explicitly informed about the current inflation rate when asked about their inflation expectations (baseline).

[23]The coefficients on macro news in Columns (3) and (4) are an order of magnitude larger than in Columns (1) and (2). This reflects the fact that inflation surprises are much smaller.

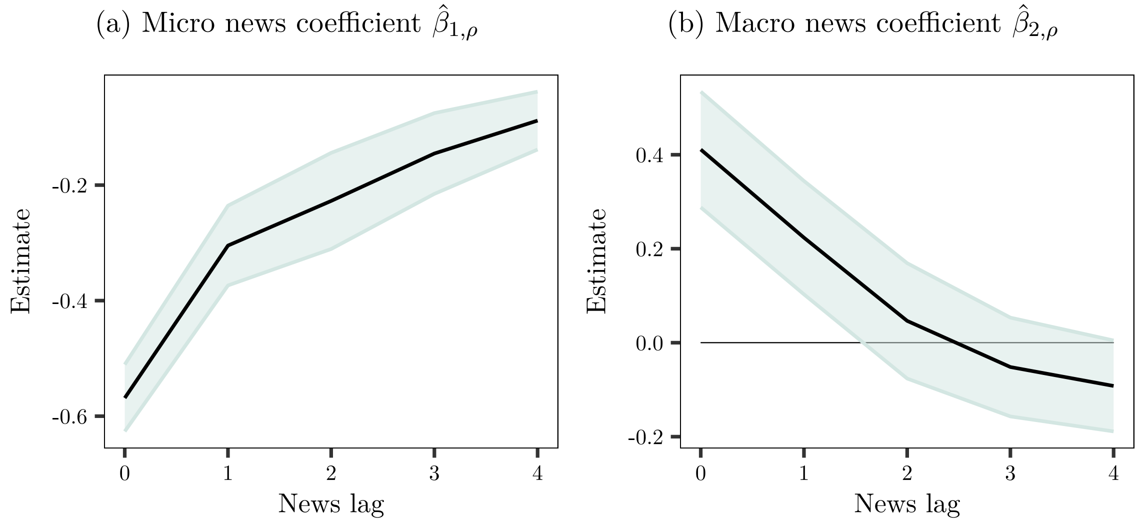
[24]See Table 1 for the exact wording. The information treatment generates exogenous variation in inflation expectations and is shown to influence not only pricing decisions but also credit demand, employment, and capital. Ropele et al. (2024) utilize the survey to study how the dispersion of beliefs about future inflation influences the misallocation of resources. Rosolia (2021) investigates how the information provision impacts the level of inflation expectations, as well as pricing and labor demand.

We find that our results are robust along a number of additional dimensions, and provide results in the appendix. We estimate an overreaction to micro news and an underreaction to macro news for both small and large firms, with the underreaction to macro news tending to be more pronounced for large firms, see Table A.2. We also restrict the sample to observations through 2019 to check whether the results are driven by the pandemic and the subsequent inflation spike. And indeed, in this case the underreaction to macro news is still highly significant, but weaker, see Column (1) of Table A.4 in the appendix. Hence, greater inflation variability after the pandemic likely helps to better identify underreaction to macro news. Results are also robust as we consider an alternative measure of macro news. In the baseline, macro news is the change in the four-quarters-ahead inflation forecast from one quarter to the next and, as such, does not pertain to the same target date. To address this issue, we exploit the fact that the SIGE surveys firms' annual inflation expectations not only four quarters ahead but also two and eight quarters ahead.[25] Hence, to measure news based on a fixed target date, we simply compute the difference between the current short-term forecast and the lagged longer-term forecast. We do so for two alternative macro-news measures by comparing, first, current two-quarters-ahead forecasts of inflation to four-quarters-ahead inflation forecasts reported two quarters ago and, second, by comparing current four-quarters-ahead forecasts to eight-quarters-ahead forecasts reported four quarters ago. For both of these fixed-target measures, we obtain results that are very similar to the baseline; see again Table A.4.

We further verify that our results also hold for numerous alternative specifications. Namely, if we no longer winsorize survey variables or if we trim the top and bottom 1% of survey variables, results are very similar to the baseline; see Panels (a) and (b) of Table A.5. We also consider alternative ways to purge forecast revisions of their macro component. First, we employ time-fixed effects and isolate micro news as the deviation from the cross-sectional mean even though, strictly speaking, this mean is not observable by firms in real time. Second, we purge micro news of recent changes in inflation with homogeneous loading γ (instead of γ_i). Results are similar to the

[25]Questions about two-quarter-ahead inflation expectations were introduced in 2010. Four-quarters-ahead expectations are available for the entire sample period. Eight-quarters-ahead expectations were introduced in 2009. See Appendix A.2 for details.

Figure 2: Response of price expectations to current and past news



Notes: Results based on Specification (2), where we extend the baseline specification to include four lags of micro and macro news, that is, firms' forecast revisions (first differences) for their own prices (micro news) and aggregate inflation (macro news). Panel (a) shows point estimates and confidence intervals for current and lagged micro news. Panel (b) shows point estimates and confidence intervals for macro news. Confidence intervals are at the 95-percent level in both panels. Firm-fixed effects are included and standard errors are clustered at the firm level.

baseline, as Panel (c) shows. Lastly, we show that our results also hold when including only micro and macro news separately instead of including them jointly: Panel (d).

In principle, as discussed in Section 2 above, measurement error may induce a negative contemporaneous correlation between the forecast error and the forecast revision—a risk that we reduce by winsorizing observations in the baseline. Now, we go one step further and estimate the dynamic Specification (2) and show results in Figure 2. The solid line represents the point estimates for various news lags, and the shaded area indicates 95-percent confidence intervals. We find there is overreaction not only to contemporaneous micro news but also to lagged news: Panel (a). Indeed, the negative coefficient on contemporaneous news is slightly larger than in the baseline specification, and the overreaction persists for news up to one year old. We are thus confident that measurement error is not driving our results. We also find that the underreaction to macro news is fairly persistent, albeit to a lesser extent than the overreaction to micro news: Panel (b).

4 Production expectations

We complement the evidence from the SIGE with evidence from the ifo survey of German firms. We do so with a focus on production expectations rather than price expectations. In addition to robustifying our results along this dimension, the ifo survey features long time series for individual firms, thus allowing us to probe into the heterogeneity of the expectation-formation process across firms.

4.1 The ifo Business Climate Survey

The *ifo Business Climate Survey*, or ifo survey for short, is maintained by the ifo institute in Munich and a mostly qualitative, monthly survey representative of the German economy (Hiersemenzel et al. 2022). It has been conducted since 1949 and its design has since been adopted by surveys worldwide (Becker and Wohlrabe 2008; Born et al. 2023). By way of compensation, participating firms receive sectoral and aggregate survey results, a feature we rely on below. The average monthly response rate is 82 percent, and the sample attrition is moderate (Enders et al. 2022). Our sample runs from April 2004 to December 2019.[26] Given our focus on production expectations, we only use data from the manufacturing sector, and given that we are particularly interested in estimates for individual firms, we restrict our sample to those firms that have been in the survey for at least 30 months.[27] In any given month, this leaves us with at least 1,000 responses, and often considerably more.

The ifo survey features questions about expected and realized production, where firms can report either an increase, no change, or a decrease; see Panel (a) of Table 3 for details. We follow the approach of Bachmann et al. (2013) to compute forecast errors based on these qualitative responses. We aggregate the monthly changes in realized production over three months as reported ex-post and compare the result with the ex-ante expectation for the same period; see Panel (b) of Table 3. As before,

[26]The ifo survey was launched in 1949, and the underlying micro data is available from 1980 onward. Some aggregate statistics based on it were first used by Theil (1955). As discussed below, our sample is restricted by data we rely on to construct macro news. The individual filling a firm's questionnaire is a member of the senior management; 85 percent are CEOs or department heads (Sauer and Wohlrabe 2019).

[27]Given the ifo survey runs at monthly frequency, we use a higher threshold for the minimum number of observations than for the SIGE (minimum: 20 quarters). Also, for inclusion, we require firm responses to exhibit some time-series variation in their expectations and expectation errors.

Table 3: ifo Business Climate Survey

(a) Definition of variables

Label	Name	Wording
$F_t^i(y_{t+3,t}^i)$	Exp. change in own production	Plans and expectations for the next 3 months: Our production is expected to be: [1] increasing [0] not changing [-1] decreasing
$y_{t,t-1}^i$	Realized change in own production	Review – tendencies in [t-1]: Compared to [t-2], our production: [1] increased [0] stayed about the same [-1] decreased

(b) Construction of micro news, macro news, and forecast errors

Component	Definition	Alternative/robustness
Micro news	$\text{sign}\{F_t^i(y_{t+3,t}^i) - F_{t-1}^i(y_{t-1+3,t-1}^i)\}$	net of $\gamma_i \Delta\Gamma_t$
Macro news	no macro expectations solicited	ifo index$_{t-1}$−median forecast$_{t-1}$
Forecast error	$\begin{cases} 0 \text{ if } \text{sign}(y_{t+3,t}^i) = F_t^i(y_{t+3,t}^i) \\ \frac{1}{3}\left(y_{t+3,t}^i - F_t^i(y_{t+3,t})\right) \text{ else} \end{cases}$	–

Notes: Panel (a): definition of variables and questions of Business Climate Survey. All questions are qualitative (increase, decrease or no change); t denotes month of the survey. See Table A.6 for the complete set of questions that we use. Panel (b): definition of variables featured in baseline specification. γ_i indicates firm-specific factor loadings used to purge micro news of their potential macro component Γ_t (see Footnote 32). Definition of forecast error is from Bachmann et al. (2013).

our basis for measuring micro news is the forecast revision of firms. Formally, given the qualitative responses in the ifo survey, we define the forecast revision of firm i in month t as the sign of the first difference in production expectations. It is equal to 0 when there is no change in expectations, equal to $+1$ for an upward revision (for example, from no change in $t-1$ to an increase in t), and equal to -1 for a downward revision (for example, from no change in $t-1$ to decrease in t). As mentioned above, we assume the forecast revision reflects news because the overlap in the revision is two months.[28] Likewise, we need to control for macro news to isolate the effect of micro news that is reflected in the forecast revision.[29]

[28] We verify that the forecast revisions are informative by relating the average forecast revisions over time to German manufacturing production growth, see Figure A.3: The average forecast revision is a leading indicator for changes in manufacturing production. This was especially visible during the Great Recession and in 2018/2019, when the manufacturing sector cooled considerably.

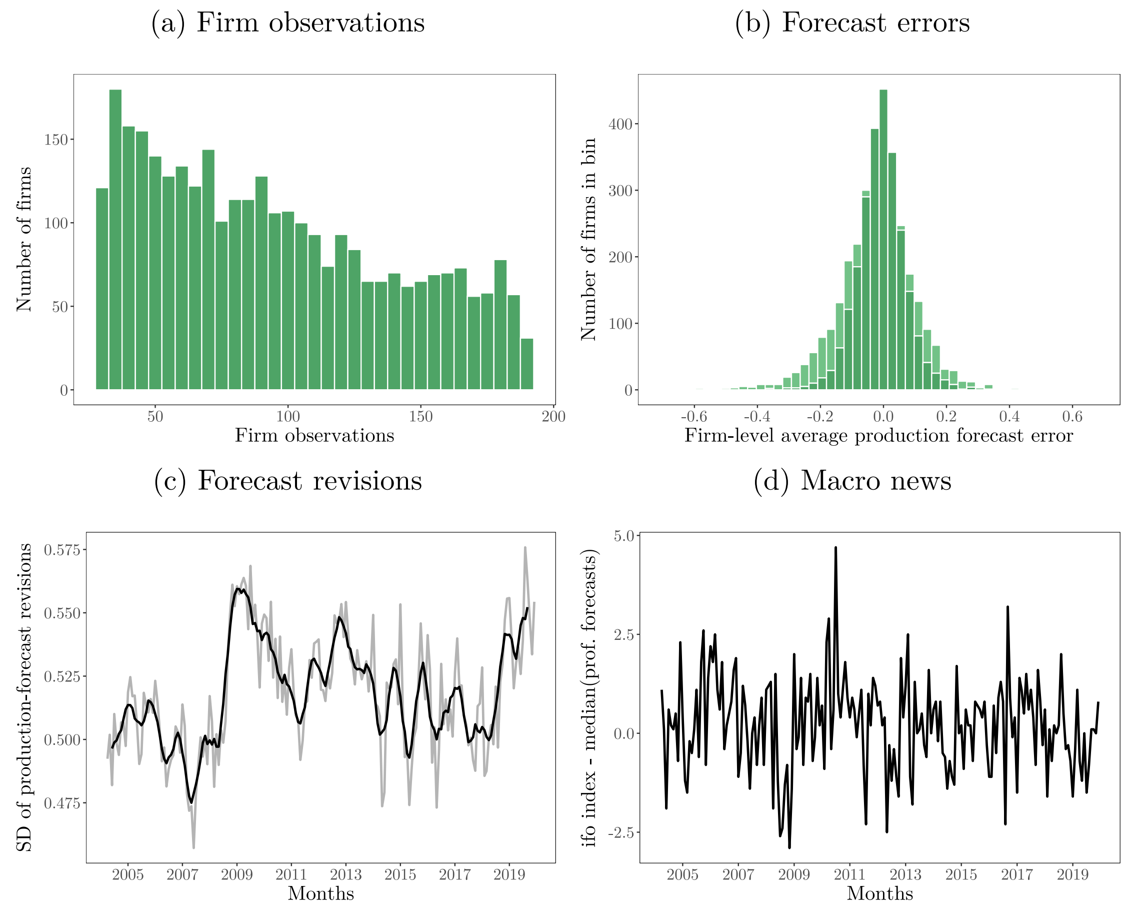
[29] As with the SIGE, we find that macro news impacts forecast revisions significantly, see Table A.7 for a range of specifications that interact macro news with several indicators.

Yet, in contrast to the SIGE, the ifo survey does not solicitate macroeconomic expectations regularly. We, therefore, measure macro news by the surprise component of the ifo index, an aggregate index compiled based on the ifo survey and a widely watched indicator of the German business cycle (Carstensen et al. 2020; Lehmann 2023). We compute the surprise component by subtracting the consensus forecast for the index, compiled by Bloomberg, from the actual index once it is released.[30] Importantly, we require macro news to be in the forecasters' information set, given Specification (1). This is likely to be the case for the surprises of the ifo index for several reasons. As stressed above, participating firms receive the latest release of the ifo index as a token of appreciation. In addition, media attention to the index is high. The ifo index is ranked among Bloomberg's '12 Global Economic Indicators to Watch,' and news outlets regularly report on the realized value as well as on the professional forecasts. In addition, Link et al. (2023) show that in the ifo survey, firms' expectations about the macroeconomy align well with those of professional forecasters.

Figure 3 presents basic statistics for the ifo survey and is organized in the same way as Figure 1 above. Panel (a) shows the distribution of firms sorted according to the number of months a firm is in the sample. Here, the median is around 90 months, and 25 percent of firms are in the survey for over 130 months. These numbers are considerably higher than in the case of the SIGE and allow us to zoom in on the firm-level heterogeneity below. Panel (b) shows the distribution of forecast errors. Just like in the case of the SIGE, they are generally well-behaved: More than 75 percent of firm-level average forecast errors are not significantly different from zero. In Panel (c) we display the cross-sectional dispersion of forecast revisions and how it fluctuates over time. It is largest during the Great Recession, the Euro debt crisis, and towards the end of our sample. Panel (d) shows the time series for macro news.

[30]Bloomberg surveys professional forecasters who can submit and update their forecasts of macro indicators, for example, GDP and employment, but also the ifo index, up until its release. For the ifo index, the consensus forecast is based on about 40 forecasters; it has been available since April 2004. This constrains the beginning of our sample period.

Figure 3: Basic statistics for the ifo survey



Notes: Panel (a): distribution of monthly firm observations. Panel (b): histogram of firm-level average forecast errors for production. Color indicates if estimates significantly differ from zero at the five percent level (light green) or not (dark green). Panel (c): cross-sectional standard deviation of forecast revisions. The grey line depicts the standard deviation of forecast revision at the monthly level, and the black line depicts the six-month rolling average. Panel (d): macro news over time, defined as the surprise in the ifo index compared to median professional forecasts, see Table 3b.

4.2 Results for production expectations

Armed with these definitions, we revisit our baseline Specification (1) using firms' production expectations. We first pool, as before, observations across time and firms while allowing for firm-fixed effects. Table 4 reports the results. Column (1) is based on the specification that simultaneously features forecast revisions and macro news.

Table 4: Response of production expectations to news

	Firms' forecast errors about their own production			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.191***			
	(0.001)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_i \Gamma_t$		-0.209***	-0.208***	
		(0.001)	(0.001)	
Macro News				
Surprise component of the ifo index	0.022***	0.022***		0.021***
	(0.0007)	(0.0007)		(0.0007)
Observations	302,737	302,737	302,737	302,737
R^2	0.16260	0.15806	0.15313	0.08967
Within R^2	0.08471	0.07974	0.07435	0.00498

Notes: Results based on Specification (1); observations are pooled across firms. The table shows results for the qualitative production expectations (3-month horizon) for German firms surveyed monthly in the ifo survey. Macro news is the surprise component of the ifo index. Column (1): micro news measured by forecast revisions (while controlling for macro news). Columns (2) and (3): micro news measured by forecast revisions net of real-time observable macro indicators, Γ_t, with firm-specific loading γ_i (see Table 3). Column (4): macro news only. All specifications include firm-fixed effects and standard errors clustered at the firm level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

We find that production expectations, too, overreact to micro news and underreact to macro news. While this pattern is consistent with island illusion, its robustness is remarkable because it emerges as we estimate Specification (1) on data sets which differ not only—among other things—in terms of country, data frequency, and survey design but, importantly, also in terms of firm-level variables: price expectations vs. production expectations.[31]

The remaining columns of the table further validate the robustness of our results: The micro coefficient remains negative and highly significant when we purge the forecast revision of the impact of real-time macro indicators, Γ_t, with firm-specific loadings γ_i (second column).[32] In fact, estimates hardly differ from the baseline. In

[31]The ifo survey also features price expectations. We verify that in this case, too, our main result obtains: see Table A.10 in the appendix.

[32]Since the ifo survey does not ask firms about their aggregate inflation expectations, we rely on a set of macroeconomic indicators to proxy the relevant information set of firms: real-time monthly changes in German industrial production, the CPI, manufacturing orders, the stock market index DAX, as well as month-fixed effects to control for potential seasonality.

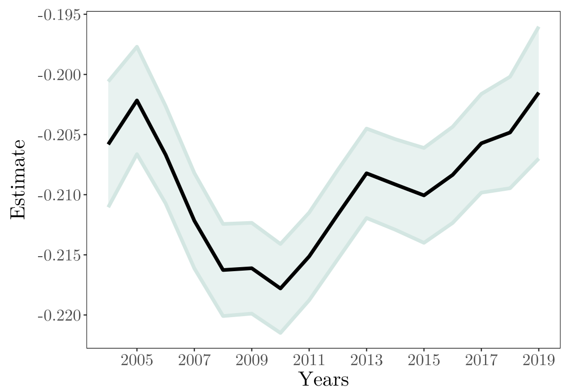
what follows, we, therefore, always measure micro news by the forecast revision net of the macro factors. Note further that when we drop macro news from the regression, the result for the impact of micro news also remains virtually unchanged (third column). The macro coefficient remains positive and significant when including only macro news in the regression (fourth column).

Note that the magnitude of the coefficients in Table 4 is again quantitatively relevant—although not as straightforward to assess due to the qualitative nature of the forecast revisions. Consider, for example, Column (2). A one-standard-deviation increase in micro news (0.46) predicts a forecast error of -0.1 (-0.209×0.46; that is, 0.27 standard deviations of the forecast error). A one-standard-deviation increase in macro news (1.2) leads to a forecast error of 0.03 (0.022×1.2; 0.08 standard deviations of the forecast error). Hence, the effects on forecast errors are not negligible, and the micro-news effect is about three times stronger than that of macro news. In terms of standard deviations, the magnitude is very close to our findings for the SIGE.

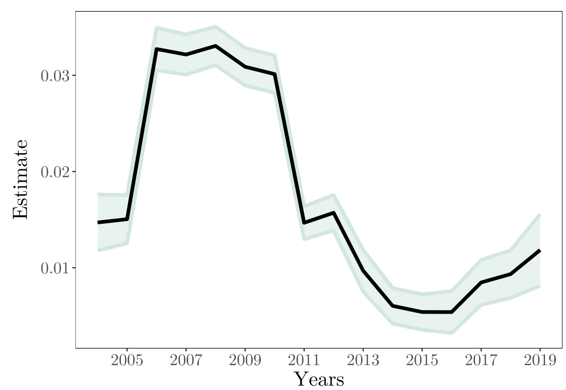
We further verify that results are robust across a range of alternative specifications. We show first that forecast errors are also significantly affected by past news in Figure A.5 and report results of additional robustness tests in Table A.8. This includes, first, estimates based on a subsample of observations restricted to firms that expect no production change. In this way, we ensure that the results are not mechanically biased by the qualitative revision scale. Next, in addition, we also set small forecast errors (i.e., $\pm 1/3$) to zero. Second, we estimate a specification in which we again set small forecast errors—potentially driven by measurement error—to zero and, in a further addition, do so only for firms that expect 'no change' in production. Third, we use an ordered logit rather than OLS for the estimation. Fourth, we consider alternative ways to measure macro news. Specifically, we purge firms' forecast revision through time-fixed and time-sector-fixed effects. Lastly, we vary the measure for macro news and replace the surprise component in the ifo index, in turn, with the surprise component in manufacturing orders, the change in the ifo index, the average forecast revision, the average forecast revision per sector, and the change in the stock market index. We find robust overreaction to micro news and underreaction to macro news across all specifications.

Figure 4: Response to news over time

(a) Response to micro news over time



(b) Response to macro news over time

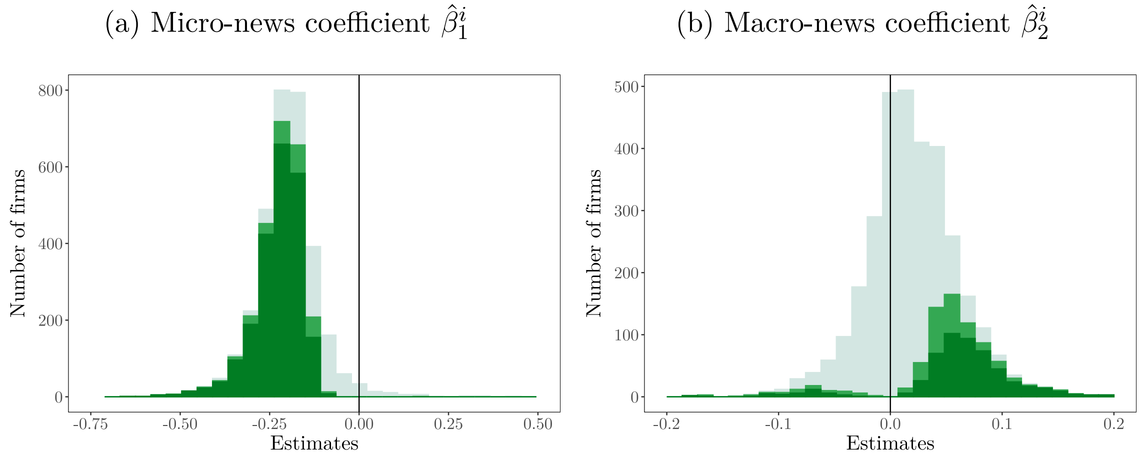


Notes: Estimates based on five-year rolling windows. Black lines represent point estimates; grey areas correspond to 95 percent confidence intervals.

The ifo also elicits a quantitative measure of firm expectations, which pertains to a firm's expected business situation over the next six months, and answers are provided in a range from 0 (rather less favorable) to 100 (rather favorable). Correspondingly, the survey also asks about the current business situation, with possible answers ranging from 0 (bad) to 100 (good); see Table A.6. We use these answers to compile a quantitative measure of forecast errors but note that in this case, data is only available for a subset of firms and since September 2005. Micro and macro news are measured in the exact same way as above, except that micro news is measured quantitatively in terms of revisions in business expectations instead of production expectations. Here, we also find overreaction to micro and underreaction to macro news; see Table A.9.

Finally, because the ifo panel is sufficiently large, we can also investigate whether the patterns in the data are robust over time. For this purpose, we follow Coibion and Gorodnichenko (2015) and estimate the baseline specification on five-year rolling windows. Figure 4 shows how the estimated response coefficients evolve over time both for micro news (left) and for macro news (right). We observe, first, that firms overreact to micro news and underreact to macro news over the entire sample. Second, there is a co-movement of overreaction and underreaction. Such a pattern is consistent with Proposition 1: If the extent of island illusion varies over time, overreaction and underreaction will co-move in sync. Third, for macro news, the variation over time

Figure 5: Firm-by-firm estimates



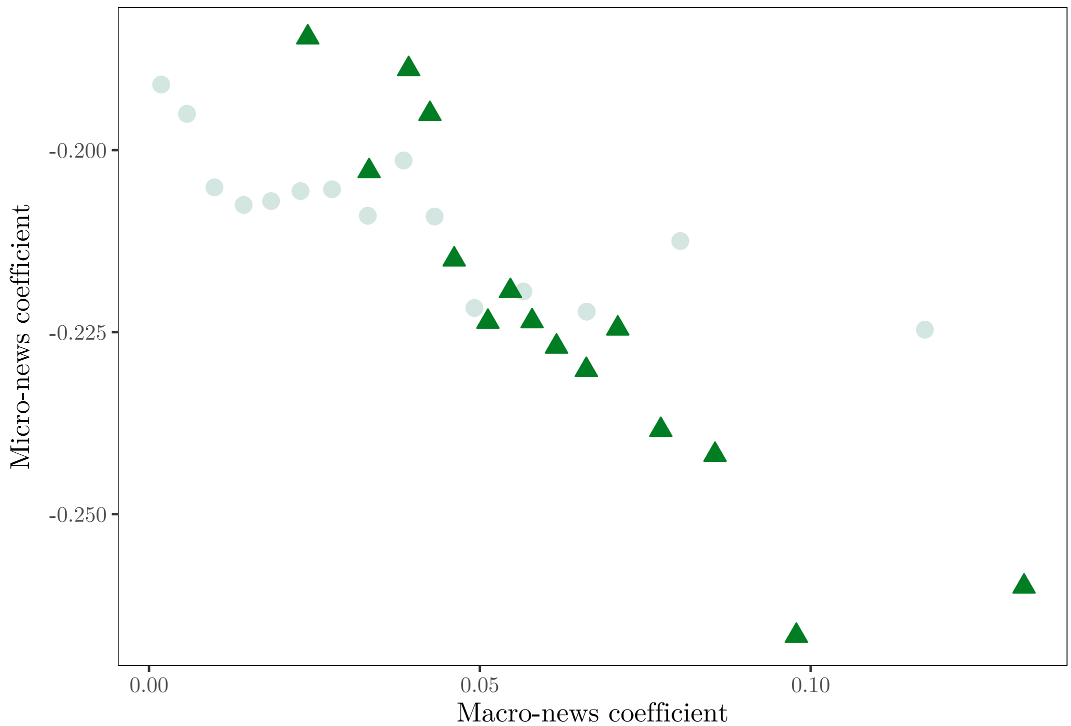
Notes: Distribution of estimates for individual firms on Specification (1) for production expectations of German firms in the ifo survey (three-month horizon, qualitative data). Grey area represents insignificant estimates, light green area represents estimates significant at the 10% level, dark green area indicates significance at the 5% level.

appears to be substantial in economic terms: the underreaction is about three times as large during the Great Recession compared to non-recession periods. Taken at face value, this may appear surprising because one might expect firms to pay more attention to the aggregate economy in times of crisis (see also, Flynn and Sastry 2024). Yet, as we document below, an increased underreaction may reflect a stronger impact of macro variables on firm outcomes without a sufficiently large increase in attention. Consistent with this notion, we find a weaker underreaction to macro news after the Great Recession: The crisis may have increased the attention firms pay to the macroeconomy, resulting in less underreaction once the macro environment stabilized.

4.3 Firm-level variation

The ifo survey features sufficiently long time series for individual firms so that we can confidently estimate the reaction to news firm by firm. Specifically, we re-estimate Specification (1) for each of the 3,215 firms in our sample and show the distribution of the estimates for β_1 and β_2 in Figure 5. There is a clear pattern: Panel (a) shows that the mass of the estimates for β_1 is concentrated to the left of zero, with most estimates being significantly smaller than zero (dark green bars). Specifically, for the subset of

Figure 6: Relation between macro and micro coefficients at the firm level



Notes: The figure displays two binned scatter plots (15 bins) between firm-level micro-news coefficients and macro-news coefficients. The grey points display the binned scatter for the set of firms with negative micro-news coefficients and positive macro-news coefficients ($\rho = -0.09$). The green triangles display the binned scatter based on the set of firms with significantly negative micro-news coefficients and significantly positive macro-news coefficients ($\rho = -0.35$).

significant estimates, β_1 is negative for all firms. Hence, overreaction to micro news is a pertinent feature in firms' expectation formation. Instead, the estimates for β_2 are centered to the right of zero; see Panel (b). In this case, estimates are not always significantly different from zero (grey bars), but when we consider significant estimates only, the macro coefficient is positive for 92 percent of firms.[33]

Given the firm-level variation, we investigate whether a systematic relationship exists between the estimated coefficient in the cross-section of firms. To this end, we show a binned scatterplot of the micro and macro news coefficients in Figure 6: There

[33]Repeating this exercise for the SIGE, where the number of firms is substantially smaller and the time series per firm are shorter, yields similar results, see Figure A.2.

Table 5: Accounting for firm-level heterogeneity

		Micro News			Macro News		
Interaction	N	$\widehat{\beta}_i$	$SE(\widehat{\beta}_i)$	W	$\widehat{\beta}_i$	$SE(\widehat{\beta}_i)$	W
(1) News	302,737						
Overall (see Table 4)		-0.209^{***}	0.001		0.022^{***}	0.001	
(2) News	302,737			0.001			0.000
× 1. Quartile by employees		-0.216^{***}	0.003		0.013^{***}	0.002	
× 2. Quartile by employees		-0.211^{***}	0.002		0.019^{***}	0.001	
× 3. Quartile by employees		-0.210^{***}	0.002		0.022^{***}	0.001	
× 4. Quartile by employees		-0.203^{***}	0.002		0.026^{***}	0.001	
(3) News	162,776			0.554			0.408
× Firm age $<$ 20 years		-0.205^{***}	0.005		0.019^{***}	0.003	
× Firm age $\geq$ 20 years		-0.208^{***}	0.002		0.021^{***}	0.001	
(4) News	302,737			0.919			0.045
× Time in survey $<$ half a year		-0.210^{***}	0.010		0.033^{***}	0.006	
× Time in survey $\geq$ half a year		-0.209^{***}	0.001		0.021^{***}	0.001	
(5) News	129,053			0.25			0.038
× Low business-cycle exposure		-0.203^{***}	0.003		0.016^{***}	0.002	
× Med. business-cycle exposure		-0.209^{***}	0.002		0.021^{***}	0.001	
× High business-cycle exposure		-0.208^{***}	0.003		0.022^{***}	0.002	

Notes: All regressions include micro and macro news with interaction terms and firm-fixed effects. Standard errors are clustered at the firm level. N is the number of observations, $\widehat{\beta}_i$ is the point estimate and SE($\widehat{\beta}_i$) its standard error. Column W reports the p-value for the null that the news coefficients are jointly the same. We run the Wald test separately for each type of news. For (quartiles of) the number of employees, we rely on annual questions in the ifo survey. For firm age, we rely on a one-time question about the year the firm was founded. To compute the firm age, we subtract the year of response from the year of foundation. For business-cycle exposure, we rely on a one-time question, where firms rank the importance of general economic developments in Germany for their business on a five-point scale from very important [1] to unimportant [5]. Business-cycle exposure is high when the response is very important [1], medium when the response is important [2], and low otherwise [3-5]. *** p<0.01, ** p<0.05, * p<0.1.

is a negative association, in particular for the set of firms with significant overreaction to micro news and underreaction to macro news, indicated by the dark triangles. Recall from Proposition 1 that such a negative association is precisely what we would expect if island illusion varies across firms.

We conclude this section with a brief analysis of potential drivers of the variation of firm-level estimates apparent in Figure 5. Specifically, we re-run the estimation on pooled samples but add interaction terms that control for specific dimensions of heterogeneity. Table 5 reports results. The micro coefficient is robustly negative in the cross-section and does not differ systematically along many dimensions. We run a Wald test and find that across different levels of firm age (Panel 3), time in the survey (Panel 4), and the self-reported importance of the business cycle (Panel 4), there are no significant differences. The overreaction significantly decreases with firm size (Panel 2), but the differences in terms of magnitude are small. This is consistent with the evidence in Panel (a) of Figure 5, which shows that the estimates for β_1 cluster in a fairly tight range. Turning to the response to macro news, we find the underreaction to macro news is strictly and statistically significantly increasing across employee quartiles (Panel 2). The underreaction of the largest firms is twice as strong as that of the smallest firms. This result may reflect a stronger impact of the macroeconomy on the production—and hence the forecast errors—of larger firms. Regarding firm age, there is no statistical difference in the response to macro news between young and old firms. When comparing the underreaction of firms that recently joined the survey (within six months) to firms with longer tenure, we find evidence for "learning through survey" (Kim and Binder 2023). The underreaction among longer-tenured firms is about one-third smaller than for firms that recently joined the survey, and the difference is statistically significant. For the exposure to the business cycle, we distinguish between firms that rank the business cycle as very important, important, or less important to them. Here, in line with the effect of firm size, a high business-cycle exposure comes with a significantly larger underreaction, consistent with Corollary 1.

4.4 Real effects

Expectations matter for firm decisions and outcomes, as a recent study confirms for the ifo survey (Enders et al. 2022). Against this background, we investigate whether overreaction and underreaction to news are associated with measures of firm performance. Specifically, in the cross-section of firms, we relate the estimated response coefficients to profits, production volatility, and forecast error volatility. We restrict the sample to firms that overreact to micro and underreact to macro news.

Since 2009, the ifo survey asks firms twice a year about profits in the current year, in May and September.[34] For each firm, we calculate the average profit and regress

[34]We build our measure of firm profits based on the September wave, subtracting from the response

Table 6: Over- and underreaction to news and real activity

	mean$_i$(profits$_{it}$)		sd$_i$(production$_{it}$)		sd$_i$(error$_{it}$)	
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.224		0.383***		0.226***	
	(0.177)		(0.011)		(0.007)	
Reaction to micro news ($\beta_1 < 0$)	1.70**	1.79**	-0.371***	-0.360***	-0.318***	-0.312***
	(0.782)	(0.756)	(0.046)	(0.046)	(0.028)	(0.028)
Reaction to macro news ($\beta_2 > 0$)	-0.673	-1.10	1.63***	1.61***	1.31***	1.30***
	(1.79)	(1.78)	(0.097)	(0.097)	(0.062)	(0.062)
Observations	1,691	1,691	2,227	2,227	2,227	2,227
R^2	0.003	0.051	0.146	0.162	0.230	0.252
Within R^2		0.004		0.143		0.228
Sector FE		✓		✓		✓
Size FE		✓		✓		✓

Notes: Estimates from linear regressions of average profits, Columns (1)–(2), production dispersion of firms, Columns (3)–(4), and forecast-error dispersion, Columns (5)–(6), on the firm-by-firm estimates of the micro and macro news coefficients. The sample is restricted to firms that overreact to micro news and underreact to macro news. Size-fixed effects refer to firm-size quartiles based on the number of employees. Standard errors are clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1.

them on the micro and macro news coefficients estimated in Section 4.2. In addition, we absorb sector- and size-fixed effects. Table 6, Columns (1) and (2), shows that a stronger overreaction to micro news is associated with significantly lower average profits, while a stronger underreaction to macro news is not significantly related to the average profits. Quantitatively, a one standard deviation increase in the overreaction to micro news leads to an average reduction in profits by about 0.14 percentage points.

Second, we calculate the standard deviation of realized production changes as a proxy for firm-level production volatility. We then follow the procedure above and regress it on the estimated response coefficients to micro and macro news, obtained in Section 4.2. Columns (3) and (4) in Table 6 show a tight relation between production volatility and the over- and underreaction to news at the firm level. An increase in the overreaction to micro news is associated with higher volatility. While the point estimate is larger for micro news than for macro news, a one standard deviation

the annual cross-sectional average of firm profits to ensure that the results are not confounded by heterogeneity over time (in a recession, profits are lower and underreaction stronger, see Section 4.3).

increase in the estimated coefficient is associated with a somewhat stronger increase of output volatility in the case of macro news. Projecting these cross-sectional estimates to the macro level implies higher micro-level volatility in the presence of over- and underreaction, potentially explaining the high observed idiosyncratic volatility of firm outcome variables (Bachmann et al. 2013; Bloom 2009; Bloom et al. 2018).

Lastly, we do the same for the standard deviation of qualitative forecast errors as a proxy for the accuracy of firm expectations. Columns (5) and (6) in Table 6 display the results. Again, the estimates indicate a tight (negative) relation between the accuracy of forecasts and the over- and underreaction to news at the firm level.

5 Aggregate implications

The firm-level evidence points to a significant departure from rational expectations, consistent with the notion of island illusion. In what follows, we provide a first assessment of whether island illusion matters for macroeconomic dynamics.[35] For this purpose, we embed it in the workhorse model of noisy information of Lorenzoni (2009). The original version of the model relaxes the full information assumption, assuming that firms and households do not observe shocks directly. Yet it still maintains rational expectations because the estimates of the shocks are updated rationally given the signals that households and firms receive. This setup is particularly suitable for introducing island illusion: We can simply assume, as in the stylized version of the model introduced in Section 2.2, that firms' subjective weights in the Kalman filter are no longer equal to the true shock variances but are distorted by island illusion.[36]

In contrast to Section 2.2, we now employ the full model and, to tie our hands, stick to the original calibration of Lorenzoni (2009). Allowing for island illusion then amounts to introducing one additional model parameter only: Υ. To pin down this parameter, we rely on an indirect inference procedure: We simulate the model for

[35] Recent work has explored the aggregate implications of *diagnostic expectations*. They can lead to boom-bust cycles and can amplify shocks in business cycle models (Bianchi et al. 2024a; L'Huillier et al. 2024). Yet, as discussed above, they do not account for the simultaneous under- and overreaction to news that we find to be a pervasive feature of firm-level data.

[36] As discussed in Section 2.2, the information flow in the Lorenzoni model spans multiple periods. In particular, last period's forecasts are revised today as news materializes, which in turn changes expectations about future prices.

Table 7: Overreaction and and underreaction to news—Monte Carlo evidence

	Firms' forecast errors about their own prices	
	$\Upsilon = 1$	$\Upsilon = 1.003$
Micro News		
Forecast Revision for $\pi^i_{t+1,t}$	0.002	-0.416***
	(0.002)	(0.008)
Macro News		
Public signal s_t	-0.008	1.67***
	(0.006)	(0.052)
Repetitions	1,000	1,000

Notes: Results based on Specification (1). The table reports results based on simulated data of expectations of firms' own prices. Macro news is the public signal s_t. Column (1) without island illusion, Column (2) with island illusion. *** p<0.01, ** p<0.05, * p<0.1.

alternative values of Υ and keep track of individual firms and their expectations. Based on the simulated time series, we estimate Specification (1) using firms' forecast errors and forecast revisions for their own prices.[37] We pin down Υ as we target our estimate for overreaction to micro news, β_1, reported in Table 2 above.[38]

We report results in Table 7. The left column shows estimates for the rational expectations version of the model (no island illusion). In this case, there is neither significant over- nor underreaction to micro or macro news, in line with Proposition 1. The right column shows the result as we target the actual estimate for β_1. In this case, Υ takes a value of 1.003.[39] The table also reports the implied estimate for β_2. Even as we do not target it, we obtain a significantly positive estimate. This implies underreaction to macro news, just like in the data and predicted by Proposition 1.[40]

Finally, to get a first idea of how island illusion might impinge on macroeconomic dynamics, we revisit the transmission of an aggregate TFP shock in the Lorenzoni

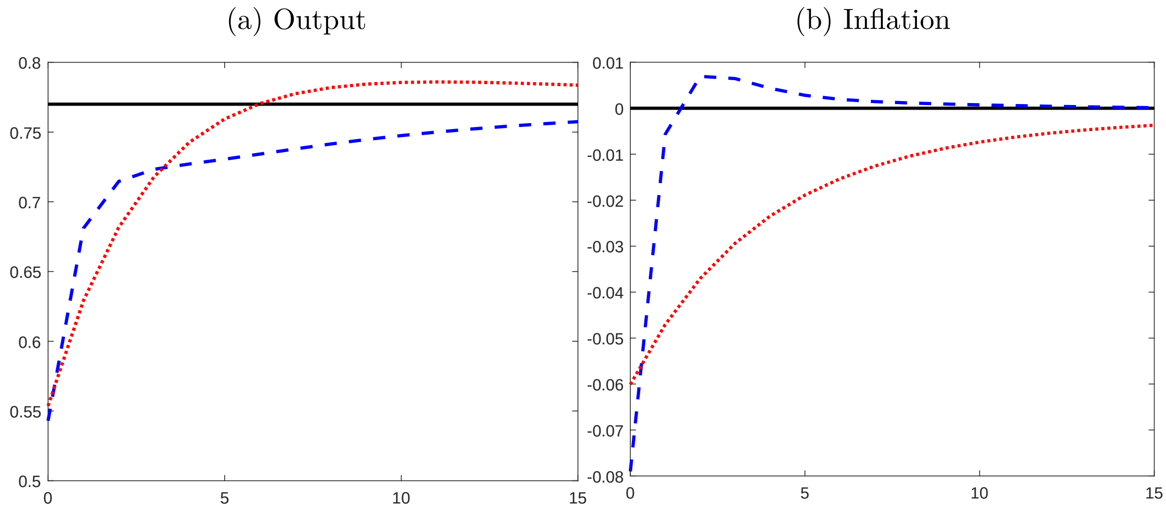
[37]To be precise, we simulate the model for 1,000 periods with an additional 2,000 burn-in periods. We define micro and macro news as in Section 2.2 above, that is, as the forecast revision and the public signal. We repeat this procedure 1,000 times for each draw of Υ and compute the average estimate and confidence intervals based on the distribution of β_1 and β_2.

[38]We target β_1 because micro news is measured consistently across surveys.

[39]A key factor that determines Υ is the ratio of the variances of idiosyncratic and aggregate shocks. Again, here we tie our hands by sticking with Lorenzoni's original calibration.

[40]Quantitatively, our simulation does not exactly reproduce the baseline empirical estimate for β_2. This is unsurprising because (i) β_2 is not a targeted moment and (ii) the empirical estimates of β_2 display substantial heterogeneity in the cross-section.

Figure 7: How island illusion alters macro dynamics—model simulation



Notes: Impulse response functions (IRFs) to one-standard-deviation TFP shock in model of Lorenzoni (2009) under alternative assumptions on expectation formation. Black solid lines: IRFs under FIRE; blue dashed lines: IRFs w/ noisy information and rational expectations ($\Upsilon = 1$), as in Lorenzoni (2009); red dotted lines: IRFs w/ noisy information and island illusion ($\Upsilon = 1.003$). Vertical axis measures percentage deviations from steady state, horizontal axis measures time in quarters.

model. Figure 7 shows the results, contrasting the impulse responses to a permanent TFP shock under FIRE (black solid lines) with the noisy information case of the original version of the model (blue dashed line) and with island illusion (red dotted lines). We focus on the responses of output (left panel) and inflation (right panel). Under full information rational expectations (FIRE), output jumps immediately to its new level while inflation remains flat since the shock is (known to be) permanent. In case information is noisy but expectations are rational ($\Upsilon = 1$, as in Lorenzoni 2009), households and firms realize only over time that the technology improvement is permanent. The output adjustment is, hence, gradual and expected demand is relatively low compared to productivity, causing inflation to drop. As prices converge towards the long-run price level, inflation slightly overshoots.

Under island illusion, adjustment dynamics differ considerably. Compared to the rational expectation case, we observe that the adjustment of output is more drawn out; later output overshoots its new long-run level. The inflation response is generally much more persistent. Because of island illusion, as discussed in Section 2.2 above, firms attribute a larger share of the improvement in technology to idiosyncratic developments—they fail to see the permanent and common nature of the shock. Consequently, and more so than under rational expectations, they overestimate their competitiveness, expect too high demand, and set prices too high. As they slowly learn about the true nature of the shock, they reduce prices gradually towards the long-run equilibrium. Monetary policy responds by keeping interest rates lower. This, in turn, explains why output overshoots after some time. Note that island illusion alters the adjustment dynamics in a way that makes the model prediction more closely aligned with the time-series evidence in Galí (1999), who finds, in particular, that inflation rebounds only gradually after a technology shock. Moreover, we also find a slight overshooting of expectations after about two years, following the initial undershooting. This pattern has been found empirically by Angeletos et al. (2021). We conclude that investigating the dynamic evolution of expectations under island illusion opens up interesting avenues of research.

6 Conclusion

How do firms adjust their expectations to news? As we address this question, we make a material and a conceptual contribution. First, our material contribution concerns a potentially important aspect of firm behavior. We find a simultaneous overreaction and underreaction of firm expectations to news, which we interpret—against the background of our model—as an instance of salience: Firms are excessively preoccupied with one portion of the environment at the expense of another. This is likely to matter for firm outcomes, and we present some evidence for island illusion to have real effects. Investigating this issue further and in more detail appears to be a fruitful avenue for future research. The same holds for macroeconomic dynamics: once we embed island illusion in the canonical model of noisy information, its predictions become better aligned with time-series evidence regarding the aggregate effects of TFP shocks.

Second, conceptually, by emphasizing the distinction between different types of news, we move beyond existing work on expectation formation that links forecast errors to news. The distinction turns out to be essential for understanding firm expectations, and we conjecture that it matters beyond the context of firms. For instance, the distinction between micro and macro news may also be relevant for investor expectations or for workers where related patterns have been identified (e.g., Daniel et al. 1998; Jäger et al. 2023). Hence, we expect—an instance of overreaction, perhaps—this conjecture to be the subject of further research, too.

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Online Appendix

A.1 Stylized model – details and proofs

Section A.1.1 presents the household sector, Section A.1.2 derives the solution of the model, and Section A.1.3 provides the proof of Proposition 1. Section A.1.4 discusses the extension for price expectations.

A.1.1 Households

The representative household maximizes a standard utility function of the form

$$U = \ln(C) + \ln(M) - \frac{1 + N^{1+\varphi}}{1+\varphi} \ ,$$

where consumption C is a Dixit-Stiglitz bundle consisting of goods from all islands with an elasticity of substitution γ. M is the (exogenously fixed) money supply, $N = \int N^i di$ total hours worked, and φ is the inverse of the Frisch elasticity. Given the budget constraint $CP + M = WN$ and market clearing, we obtain the demand function for individual goods as $Y^i = (P^i/P)^{-\gamma} M/P$. Optimal labor supply is given by $N^{\varphi}C = W/P$ and optimal money holdings by $C = M/P$.

A.1.2 Solution

Throughout, we consider a linear approximation to the equilibrium conditions of the model. Lower-case variables denote percentage deviations from steady state, and variables without island subscripts refer to economy-wide values. The wage is set at the beginning of the period based on all available information. As information sets of agents are perfectly aligned at this point, we use the expectation operator $\mathrm{F}_0 = \mathrm{F}_0^i$ to denote (common) stage-one expectations. Linearized expected labor supply can be combined with expected labor demand $\mathrm{F}_0(w - p) = \mathrm{F}_0(\varepsilon)$, the linearized production function $\mathrm{F}_0(y^i) = \mathrm{F}_0(n^i + \varepsilon)$, optimal money holdings $\mathrm{F}_0(c) = m - \mathrm{F}_0(p)$, market clearing, and symmetry assumptions to obtain $w = m$. We furthermore normalize the commonly known initial value of technology, i.e., before the realization of ε, to zero.

The mentioned equilibrium conditions, together with $\mathrm{F}_0(\varepsilon) = 0$, also imply $\mathrm{F}_0(y^i) = 0$. After w is set, firms observe their own productivity and the public signal.

Linearized demand for firm j's goods is given by

$$y^i = -\gamma p^i + (\gamma - 1)p + m \ . \tag{A.1}$$

Given the production function $y^i = a^i + n^i$, firms set prices according to

$$p^i = w - a_t^i \ . \tag{A.2}$$

Firm-specific technology equals $a^i = \varepsilon + \eta^i$ with $\int \eta^i di = 0$. Aggregating over all producers gives the aggregate price index

$$p = w - \varepsilon \ . \tag{A.3}$$

The public signal is $s = p + e$. Without loss of generality we can define ω_1 and ω_2 such that $\sigma_\eta^2 = \omega_1 \operatorname{Var}(a^i)$ and $\sigma_\varepsilon^2 = (1 - \omega_1) \operatorname{Var}(a^i)$ as well as $\sigma_\varepsilon^2 = (1 - \omega_2) \operatorname{Var}(s)$ and $\sigma_e^2 = \omega_2 \operatorname{Var}(s)$, where $\operatorname{Var}(s)$ refers to the variance of s conditional on w. Firms correctly observe the variances of their own technology $\operatorname{Var}(a^i)$ and that of the public signal $\operatorname{Var}(s)$, but not that of its components. Firms therefore form their expectation regarding ε after observing a^i and s according to

$$\mathrm{F}^i(\varepsilon) = \delta a^i - \rho(s - w) = \delta(\varepsilon + \eta^i) + \rho(\varepsilon - e) \ . \tag{A.4}$$

Here, F^i refers to subjective expectations of firm i after observing its own technology and the public signal,

$$\delta = \frac{\hat{\sigma}_e^2}{\hat{\sigma}_\eta^2 + \hat{\sigma}_e^2 + \frac{\hat{\sigma}_\eta^2 \hat{\sigma}_e^2}{\hat{\sigma}_\varepsilon^2}} \qquad \text{and} \qquad \rho = \frac{\hat{\sigma}_\eta^2}{\hat{\sigma}_\eta^2 + \hat{\sigma}_e^2 + \frac{\hat{\sigma}_\eta^2 \hat{\sigma}_e^2}{\hat{\sigma}_\varepsilon^2}} \ ,$$

where $\hat{\sigma}^2$ refers to perceived variances that result from a perceived weight $\hat{\omega}_1 = \omega_1 \Upsilon$ of idiosyncratic technology in own technology. $\Upsilon = 1$ represents rational expectations. For $\sigma_a^2 = \operatorname{Var}(a^i) = \operatorname{Var}(s) = \sigma_s^2$, the above equations collapse to those in the main text, using equation (A.3). Expectation formation is consistent with the structure of technology and the signal, such that $\hat{\sigma}_\varepsilon^2 = (1-\hat{\omega}_1)\,\mathrm{Var}(a^i) = (1-\hat{\omega}_2)\,\mathrm{Var}(s)$, i.e., $1-\hat{\omega}_2 = (1-\hat{\omega}_1)\,\mathrm{Var}(a^i)/\,\mathrm{Var}(s)$.

A.1.3 Proofs

Proof of Proposition 1 Observing market clearing and equation (A.3), aggregate output results as

$$y = m - p = m - w + \varepsilon = \varepsilon \ . \tag{A.5}$$

The gap between expected own and aggregate output can then be calculated using equations (A.1), (A.2), and (A.3), as

$$\mathrm{F}^i(y^i) - \mathrm{F}^i(y) = -\gamma\left(p^i - \mathrm{F}^i(p)\right) = \gamma\,\mathrm{F}^i(\eta^i) \ . \tag{A.6}$$

Forecast revisions are given by the change in expectations between before and after receiving the private and public signals. Before receiving the signals, firms expect their output to equal aggregate output since $\mathrm{F}_0(\eta^i) = 0 \ \forall\, i$. Equation (A.5) implies $\mathrm{F}_0(y) = \mathrm{F}_0(\varepsilon) = 0$ and $\mathrm{F}^i(y) = \mathrm{F}^i(\varepsilon)$. Using this together with equation (A.6) gives

$$FR^i = \mathrm{F}^i(y^i) - \mathrm{F}_0(y) = \mathrm{F}^i(y^i) - \mathrm{F}^i(y) + F^i(y) = \gamma\,\mathrm{F}^i(\eta^i) + \mathrm{F}^i(\varepsilon) \ . \tag{A.7}$$

Because of equation (A.4) and

$$\mathrm{F}^i(\eta^i) = (1-\delta)(\varepsilon + \eta^i) + \rho(s - w) \ ,$$

we can write the above as

$$\begin{gathered} FR^i = \gamma(1-\delta)(\varepsilon+\eta^i) + \delta(\varepsilon+\eta^i) + \rho(s-w)(\gamma-1) \equiv X\varepsilon + X^\eta\eta^i - X^e e \ , \\ \text{with} \quad X^\eta = (\gamma-1)(1-\delta) + 1 > 0 \ , \quad X^e = -\rho(\gamma-1) < 0 \ , \quad X = X^\eta + X^e > 0 \ . \end{gathered}$$

Calculating the expectation error of firms for idiosyncratic output, using the island-specific demand equation (A.1) and the price-level equation (A.3), yields

$$FE^i = y^i - \mathrm{F}^i(y^i) = \Lambda\left(\varepsilon - \mathrm{F}^i(\varepsilon)\right) = \Lambda\left[(1-\delta-\rho)\varepsilon - \delta\eta^i + \rho e\right] \ . \tag{A.8}$$

The effect $\Lambda = -(\gamma - 1)$ of the expectation error regarding aggregate technology innovations on the expectation error regarding own output is negative.

The sign of β_1 in regression (4) can then be determined in two steps. Since both independent variables, forecast revisions and the signal, are correlated, we first regress the forecast revisions on the signal, yielding the regression coefficient

$$Coef_1 = \frac{\mathrm{Cov}(FR^i, s)}{\mathrm{Var}(s)} = -\frac{X^\eta \sigma_\varepsilon^2}{\sigma_\varepsilon^2 + \sigma_e^2} - X^e \ . \tag{A.9}$$

The residual of this regression is $FR^i - Coef_1\, s$. Thus, the coefficient β_1 in equation (4) is given by

$$\beta_1 = \frac{\mathrm{Cov}(FE^i, FR^i - Coef_1 s)}{\mathrm{Var}(FR^i - Coef_1 s)} \ .$$

The sign of β_1 equals the sign of the numerator, which can be written as

$$\mathrm{Cov}(FE^i, FR^i) - Coef_1\, \mathrm{Cov}(FE^i, s) = \Lambda[X^\eta R_\eta + (X^e + Coef_1) R_e] \ ,$$

with $R_e \equiv (1-\delta-\rho)\sigma_\varepsilon^2 - \rho\sigma_e^2$ and $R_\eta \equiv (1-\delta-\rho)\sigma_\varepsilon^2 - \delta\sigma_\eta^2$. These two terms are proportional to the covariances of the forecast error with the public signal and idiosyncratic technology, respectively. Both covariances are zero under rational expectations ($\Upsilon = 1$), such that $R_e = R_\eta = \beta_1 = 0$. If firms underestimate the signal-to-noise ratio (proportional to the covariance of a^i with ε) of micro news, we get $R_\eta > 0$. In contrast, an underestimation of the signal-to-noise ratio of macro news (proportional to the covariance of s with ε) yields $R_e > 0$. Island illusion ($1 < \Upsilon < 1/\omega_{1/2}$) therefore implies $R_\eta, R_e > 0$. Hence, because of equation (A.9), β_1 is negative if

$$R_\eta - \frac{\sigma_\varepsilon^2}{\sigma_\varepsilon^2 + \sigma_e^2} R_e > 0 \quad \Leftrightarrow \quad \frac{R_e}{R_\eta} = \frac{\hat{\sigma}_\eta^2/\sigma_a^2}{\hat{\sigma}_e^2/\sigma_s^2} < \frac{\sigma_\varepsilon^2 + \sigma_e^2}{\sigma_\varepsilon^2}. \tag{A.10}$$

The sign of β_2 in equation (4) can equivalently be derived by first regressing the forecast revision on the signal, which gives the coefficient

$$Coef_2 = \frac{\mathrm{Cov}(FR^i, s)}{\mathrm{Var}(FR^i)} = -\frac{X\sigma_\varepsilon^2 + X^e\sigma_e^2}{X^2\sigma_\varepsilon^2 + (X^\eta)^2\sigma_\eta^2 + (X^e)^2\sigma_e^2} \ ,$$

such that β_2 equals

$$\beta_2 = \frac{\mathrm{Cov}(FE^i, s - Coef_2 FR^i)}{\mathrm{Var}(s - Coef_2 FR^i)} \ .$$

Its sign depends on the sign of the numerator, which can be written as

$$\mathrm{Cov}(FE^i, s) - Coef_2\,\mathrm{Cov}(FE^i, FR^i) = -\Lambda\,[(1 + Coef_2 X^e)R_e + Coef_2 X^\eta R_\eta] \ .$$

With $\Upsilon = 1$ (rational expectations), we have $R_e = R_\eta = \beta_2 = 0$. Note that $(1 + Coef_2 X^e)R_e + Coef_2 X^\eta R_\eta$ has the same sign as $[X\sigma_\varepsilon^2 + X^\eta \sigma_\eta^2]R_e - [X\sigma_\varepsilon^2 + X^e\sigma_e^2]R_\eta$, which is positive if

$$\frac{R_e}{R_\eta} > \frac{X\sigma_\varepsilon^2 + X^e\sigma_e^2}{X\sigma_\varepsilon^2 + X^\eta\sigma_\eta^2} \quad \Leftrightarrow \quad \frac{R_e}{R_\eta} = \frac{\hat\sigma_\eta^2/\sigma_a^2}{\hat\sigma_e^2/\sigma_s^2} > \frac{\sigma_\varepsilon^2}{\sigma_\varepsilon^2 + \gamma\sigma_\eta^2} \ . \tag{A.11}$$

Combining equations (A.10) and (A.11), we obtain $\beta_1 < 0$ and $\beta_2 > 0$ for

$$\underbrace{\frac{\sigma_\varepsilon^2}{\sigma_\varepsilon^2 + \gamma\sigma_\eta^2}}_{<1} < \frac{\hat\sigma_\eta^2/\sigma_a^2}{\hat\sigma_e^2/\sigma_s^2} < \underbrace{\frac{\sigma_\varepsilon^2 + \sigma_e^2}{\sigma_\varepsilon^2}}_{>1} \tag{A.12}$$

or, expressed in terms of weights

$$\frac{1 - \omega_1}{1 + \omega_1(\gamma - 1)} < \frac{\omega_1}{\omega_2} < \frac{1}{1 - \omega_2} \ .$$

Condition (A.12) states that the ratio of the subjective signal-to-noise ratios of the two signals needs to stay within certain bounds. It is automatically fulfilled for the assumption of $\mathrm{Var}(a^i) = \mathrm{Var}(s)$, made in the main text. This case corresponds to firms observing their own technology and, additionally, one price forecast based on the technology of one island, made public by, e.g., a forecasting firm on that island. In this case, $(\hat\sigma_\eta^2/\sigma_a^2)/(\hat\sigma_e^2/\sigma_s^2) = 1$. Furthermore, condition (A.12) is always fulfilled for high degrees of island illusion ($\Upsilon \to \infty$) and/or a high weight of the idiosyncratic component in technology ($\sigma_\eta^2/\sigma_a^2 \to 1$) and/or a high weight of noise in the public signal ($\sigma_e^2/\sigma_s^2 \to 1$), where the two last conditions are simultaneously given by a low volatility of aggregate technology ($\sigma_\varepsilon^2 \to 0$). The first part is also fulfilled for a high demand elasticity ($\gamma \to \infty$).

Regarding the derivatives of β_1 and β_2, note that we can write

$$\beta_1 = \frac{\Lambda}{X^\eta} \frac{R_\eta - \frac{\sigma_\varepsilon^2}{\sigma_\varepsilon^2 + \sigma_e^2} R_e}{\sigma_\varepsilon^2 \sigma_e^2/(\sigma_\varepsilon^2 + \sigma_e^2) + \sigma_\eta^2} = \frac{\Lambda}{\gamma + \delta/(1-\delta)} \left[\frac{\sigma_\varepsilon^2 \sigma_e^2}{\sigma_\varepsilon^2 + \sigma_e^2} - \frac{\delta}{1-\delta} \left(\sigma_\eta^2 + \frac{\sigma_\varepsilon^2 \sigma_e^2}{\sigma_\varepsilon^2 + \sigma_e^2} \right) \right] .$$

Its derivative w.r.t. Υ is negative whenever the derivative of $\delta/(1-\delta)$ w.r.t. Υ is negative. This is the case if

$$\frac{\hat{\sigma}_\eta^2/\sigma_a^2}{\hat{\sigma}_e^2/\sigma_s^2} < \frac{\sigma_e^2 + \sigma_\varepsilon^2}{\hat{\sigma}_\varepsilon^2} ,$$

which is given by condition (A.12). For the derivative of β_2 w.r.t. Υ, we can write

$$\beta_2 = \frac{\mathrm{Cov}(FE^i, s - Coef_2 FR^i)}{\mathrm{Var}(s - Coef_2 FR^i)} = -\Lambda \frac{\sigma_\eta^2 \sigma_\varepsilon^2 - [\sigma_e^2 \sigma_\varepsilon^2 + \gamma \sigma_\eta^2 (\sigma_\varepsilon^2 + \sigma_e^2)]\rho/X^\eta}{\sigma_\varepsilon^2 \sigma_e^2/\bar{\delta}} , \quad \text{(A.13)}$$

where $\bar{\delta}$ is δ under rational expectations, and hence independent of Υ. Hence, β_2 depends on Υ only via ρ/X^η, which can be written as

$$\frac{1 - \omega_2 \Upsilon}{\gamma + \omega_2(1/\omega_1 - \Upsilon)} . \quad \text{(A.14)}$$

The derivative of this term w.r.t. Υ is negative whenever

$$\frac{1 - \omega_1 \Upsilon}{1 + \omega_1 \Upsilon(\gamma - 1)} < \frac{\omega_1}{\omega_2} ,$$

which is given if condition (A.12) is fulfilled, such that β_2 depends positively on Υ. ■

Proof of Corollary 1 The derivative of β_2, given in equation (A.13), w.r.t. γ equals

$$\frac{\partial \beta_2}{\partial \gamma} = \frac{\beta_2}{\gamma - 1} - \frac{\gamma - 1}{\sigma_\varepsilon^2 \sigma_e^2/\bar{\delta}} \left[\left(\frac{\rho}{X^\eta} + \gamma \frac{\partial \rho/X^\eta}{\partial \gamma} \right) \sigma_\eta^2 (\sigma_\varepsilon^2 + \sigma_e^2) + \frac{\partial \rho/X^\eta}{\partial \gamma} \sigma_e^2 \sigma_\varepsilon^2 \right],$$

where we can replace $\sigma_\varepsilon^2 + \sigma_e^2$ with $\mathrm{Var}(s)$. Now note that, using equation (A.14), we can write ρ/X^η also as

$$\frac{\rho}{X^\eta} = \left(\gamma \frac{\sigma_s^2}{\hat{\sigma}_\varepsilon^2} + \frac{\sigma_e^2}{\sigma_\eta^2} \right)^{-1} ,$$

yielding

$$\frac{\partial \rho / X^{\eta}}{\partial \gamma} = -\left(\frac{\rho}{X^{\eta}}\right)^2 \frac{\sigma_s^2}{\hat{\sigma}_\varepsilon^2},$$

such that

$$\frac{\partial \beta_2}{\partial \gamma} = \frac{\beta_2}{\gamma - 1} - \frac{\gamma - 1}{\sigma_\varepsilon^2 \sigma_e^2 / \bar{\bar{\delta}}} \left(\frac{\rho}{X^{\eta}}\right)^2 \mathrm{Var}(s) \sigma_e^2 \left(1 - \frac{\sigma_\varepsilon^2}{\hat{\sigma}_\varepsilon^2}\right) > 0,$$

since, under island illusion, $\sigma_\varepsilon^2 > \hat{\sigma}_\varepsilon^2$. β_2 hence depends positively on γ. ■

A.1.4 Price expectations

To derive the expectations of firms regarding their future prices, we need to specify how technology evolves after the period of pre-set prices. We follow Lorenzoni (2009) and assume that aggregate technology ε is a random walk while the idiosyncratic component η^i is white noise. From subsection A.1.2, we have current expectations regarding the wage being equal to the money supply, $\mathrm{F}_+^i(w) = m$, where F_+^i refers to expectations regarding the time after the pre-set price period. With expected labor demand $F_+^i(w-p) = F_+^i(\varepsilon)$, it follows that

$$F_+^i(p^i) = F_+^i(p) = m - F_+^i(\varepsilon),$$

where $F_+^i(\varepsilon) = F^i(\varepsilon)$ because of the random-walk assumption. That is, firms expect their own price to be aligned with the overall price level, as idiosyncratic differences are expected to have vanished after prices are again free to be set. The price level, in turn, is determined by the money supply and aggregate production, i.e., technology. Since the aggregate price level depends on aggregate demand, which follows a random walk, the forecast revision (before and after receiving the signals) regarding the change in own future prices at the end of the pre-set period depends only on the estimated idiosyncratic component of technology:

$$F_+^i(p) - p^i = F^i(\eta^i). \tag{A.15}$$

Remember that firms expect no change in prices before receiving the signals. The forecast error is then

$$(p - p^i) - F^i_+(p - p^i) = -(\varepsilon - F^i(\varepsilon)), \tag{A.16}$$

i.e., equal to the current misperception of aggregate technology. Intuitively, if firms hold a correct estimate of aggregate technology and therefore the future price level in the case of no further shocks, they can also foresee by how much their price will move, once it can. Comparing the forecast revision (A.15) and the forecast error (A.16) to the corresponding equations in the case of production expectations, (A.7) and (A.8), shows that both are the same as for production expectations when dividing by $-\Lambda = \gamma - 1$ and letting $\gamma \to \infty$. Since the remaining derivations build on these two equations, it follows that β_1 remains unchanged and β_2 turns into $\beta_2/(\gamma - 1)$ (note that β_2 is proportional to $\gamma - 1$, such that is does not approach zero as $\gamma \to \infty$). Hence, we obtain the same results for price expectations as in Proposition 1 for production expectations.

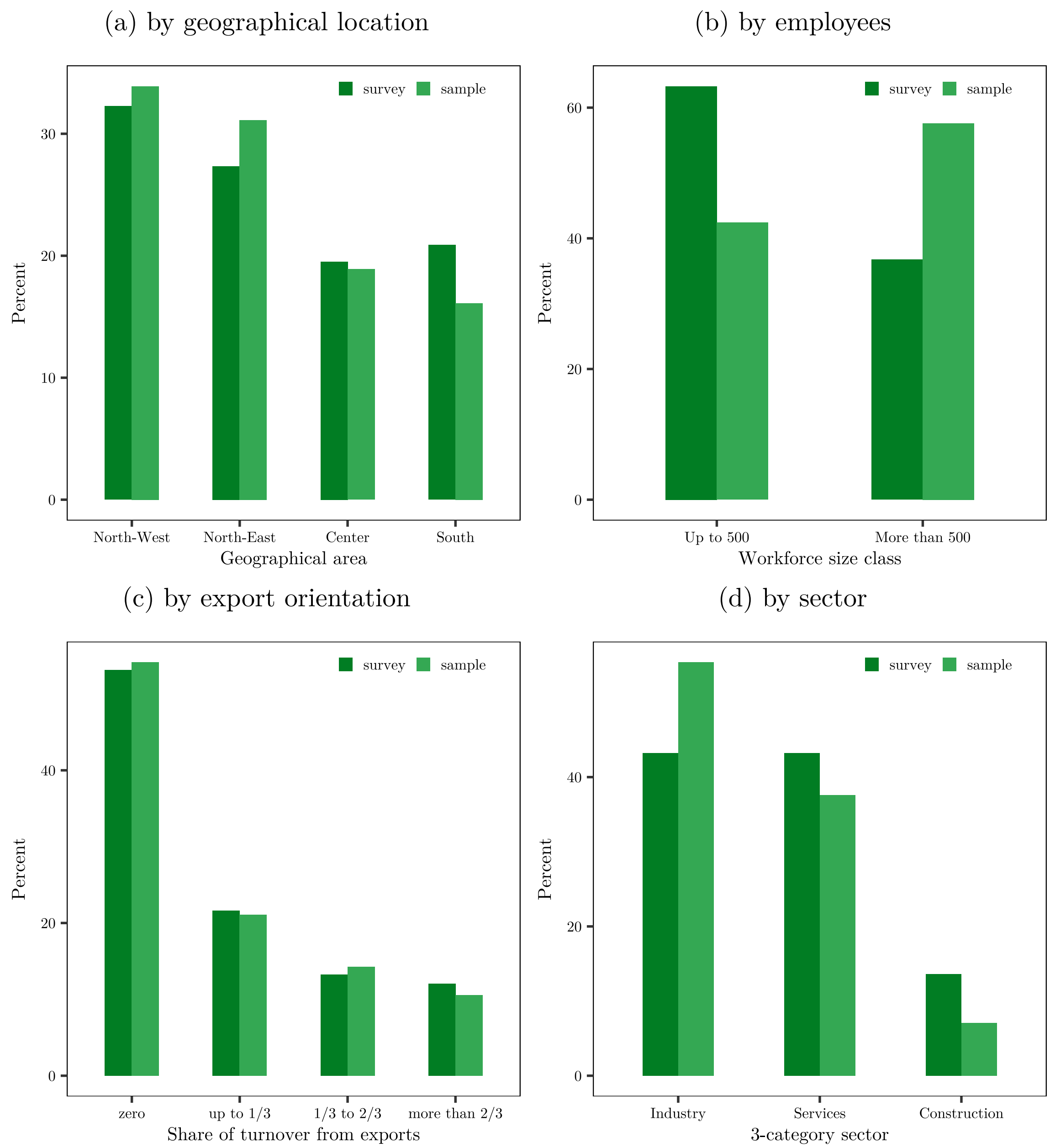
A.2 Survey on Inflation and Growth Expectations

Table A.1: Relevant questions from SIGE

Question	Name	Introduced	Wording
Q1	expected change in own price	1999q4	For the next 12 months, what do you expect will be the average change in your firm's prices?
Q2	expected inflation (12 months ahead)	1999q4	In July consumer price inflation, measured by the 12-month change in the harmonized index of consumer prices was 8.4 percent in Italy and 8.9 percent in the euro area. What do you think it will be in Italy in September 2023?
Q3	realized change in own prices	2002q4	In the last 12 months, what has been the average change in your firm's prices?
Q4	expected inflation (24 months ahead)	2009q2	In July consumer price inflation, measured by the 12-month change in the harmonized index of consumer prices was 8.4 percent in Italy and 8.9 percent in the euro area. What do you think it will be in Italy in September 2024?
Q5	expected inflation (6 months ahead)	2010q4	In July consumer price inflation, measured by the 12-month change in the harmonized index of consumer prices was 8.4 percent in Italy and 8.9 percent in the euro area. What do you think it will be in Italy in March 2023?
Q6	expected inflation (12 months ahead, no infl. update)	2012q3	What do you think consumer price inflation in Italy, measured by the 12-month change in the harmonized index of consumer prices, will be in September 2023?

Notes: Wording taken from the September 2022 questionnaire. Questions elicit growth rates in percentage points. We construct firms' forecast error for their own prices by subtracting their expectation reported in quarter t (Q1) from their realization reported in quarter $t + 4$ (Q3). For micro news, we generally consider the first difference of firms' one-year-ahead expectation for the change in their own prices (Q1). For macro news, we generally consider the first difference of firms' one-year-ahead inflation expectation (Q2). Since 2009 and 2010, the SIGE features additional questions about firms' inflation expectations six months and two years ahead (Q5 and Q4). We use these questions to construct macro news that uniquely refer to the same forecasting target. See main text for more details.

Figure A.1: Representativeness of survey and sample



Notes: Distribution of firms' geographical location, employees, export orientation and sector in the full SIGE (survey) and the sample used in our baseline specification.

Table A.2: Sample split by firm size for baseline regressions

(a) Firms with $\leq$ 500 employees

	Firms' forecast errors about their own prices				
	(1)	(2)	(3)	(4)	(5)
Micro News					
Forecast rev. for $\pi^i_{t+4,4}$	-0.467^{***}		-0.481^{***}		-0.466^{***}
	(0.025)		(0.033)		(0.024)
Forecast rev. for $\pi^i_{t+4,4}$ net of $\gamma_i \Delta\pi_t$		-0.460^{***}		-0.479^{***}	
		(0.025)		(0.034)	
Forecast rev. for $\pi^i_{t+4,4}$ $\times$ no treatment					0.001
					(0.057)
Macro News					
Forecast rev. for $\pi_{t+4,4}$	0.208^{***}	0.183^{***}			0.230^{***}
	(0.067)	(0.066)			(0.067)
Inflation surprise			2.290^{***}	2.213^{***}	
			(0.516)	(0.520)	
Forecast rev. for $\pi_{t+4,4}$ $\times$ no treatment					0.282^{**}
					(0.130)
Observations	7,494	7,494	3,489	3,489	9,222
R^2	0.2089	0.2059	0.2385	0.2379	0.1786
Within R^2	0.1154	0.1120	0.1312	0.1305	0.1111

(b) Firms with $>$ 500 employees

	Firms' forecast errors about their own prices				
	(1)	(2)	(3)	(4)	(5)
Micro News					
Forecast rev. for $\pi^i_{t+4,4}$	-0.383^{***}		-0.346^{***}		-0.383^{***}
	(0.026)		(0.058)		(0.026)
Forecast rev. for $\pi^i_{t+4,4}$ net of $\gamma_i \Delta\pi_t$		-0.378^{***}		-0.338^{***}	
		(0.025)		(0.058)	
Forecast rev. for $\pi^i_{t+4,4}$ $\times$ no treatment					-0.150^{**}
					(0.076)
Macro News					
Forecast rev. for $\pi_{t+4,4}$	0.325^{***}	0.296^{***}			0.339^{***}
	(0.074)	(0.074)			(0.075)
Inflation surprise			3.664^{***}	3.607^{***}	
			(0.605)	(0.608)	
Forecast rev. for $\pi_{t+4,4}$ $\times$ no treatment					0.373^{*}
					(0.197)
Observations	11,047	11,047	3,369	3,369	12,735
R^2	0.1434	0.1434	0.2018	0.2020	0.1372
Within R^2	0.0567	0.0567	0.0564	0.0566	0.0661

Notes: In the survey, firms report every month if they have more or less than 500 employees. We assign firms into groups based on their median response and estimate our baseline specifications separately for small and large firms. Specifications are as in Table 2.

Table A.3: Macro news and forecast revisions

	Forecast revision for			
	$\pi^i_{t+4,t}$		$\pi^i_{t+4,t}$ net of $\gamma_i \Delta\pi_t$	
	(1)	(2)	(3)	(4)
Macro News				
Forecast revision for $\pi_{t+4,t}$	0.292***		0.230***	
	(0.033)		(0.031)	
Inflation surprise		0.861***		0.636***
		(0.191)		(0.206)
Observations	22,970	8,389	22,970	8,389
R^2	0.007	0.003	0.004	0.001
Within R^2	0.007	0.003	0.005	0.001

Notes: The macro component of forecast revisions for firms' own prices. We regress firms' forecast revisions for their own prices on macro news. Columns (1) and (2) use firms' forecast revisions for their own prices as reported in the SIGE. In Columns (3) and (4), these revisions are purged of effects of recent changes in inflation. Firm-fixed effects are always included, and standard errors are clustered at the firm level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.4: The response of price expectations to news—robustness

	Firms' forecast errors about their own prices				
	(1)	(2)	(3)	(4)	(5)
Micro News					
Forecast rev. for $\pi^i_{t+4,4}$	-0.454^{***}	-0.465^{***}		-0.438^{***}	
	(0.017)	(0.026)		(0.027)	
Forecast rev. for $\pi^i_{t+4,4}$ net of $\gamma_i \Delta\pi_t$			-0.460^{***}		-0.435^{***}
			(0.026)		(0.028)
Macro News					
Forecast rev. for $\pi_{t+4,4}$	0.116^{***}				
	(0.037)				
Forecast rev. for $\pi_{t+4,4}$ (2q v 4q)		0.283^{***}	0.269^{***}		
		(0.059)	(0.059)		
Forecast rev. for $\pi_{t+4,4}$ (4q v 8q)				0.192^{***}	0.184^{***}
				(0.046)	(0.046)
Observations	19,469	9,089	9,089	9,268	9,268
R^2	0.1802	0.2281	0.2272	0.2215	0.2216
Within R^2	0.1009	0.0996	0.0987	0.0879	0.0880

Notes: Alternative measures of micro and macro news. Column (1) estimates the baseline specification where we cut off the sample after 2019 and include responses from the no-treatment group to maintain a comparable sample size. Columns (2) and (3) use as macro news firms' forecast revisions for a fixed forecasting date. Specifically, we subtract from firms' current two-quarters-ahead inflation forecast their four-quarter-ahead forecasts reported two quarters ago. For Columns (4) and (5), we proceed similarly but compare current four-quarter-ahead forecasts to eight-quarter-ahead forecasts reported four quarters ago. Firm-fixed effects are always included. Standard errors are clustered at the firm level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.5: Additional regression results from the SIGE

(a) without winsorizing survey variables

	Forecast error about firm's own prices			
	(1)	(2)	(3)	(4)
Micro News				
Forecast revision for $\pi^i_{t+4,t}$ (all obs.)	-0.431^{***}		-0.401^{***}	
	(0.029)		(0.043)	
Forecast revision for $\pi^i_{t+4,t}$ net of $\gamma_i \Delta\pi_t$ (all obs.)		-0.438^{***}		-0.417^{***}
		(0.022)		(0.032)
Macro News				
Forecast revision for $\pi_{t+4,t}$ (all obs.)	0.316^{***}	0.305^{***}		
	(0.088)	(0.089)		
Inflation surprise			3.994^{***}	3.925^{***}
			(0.792)	(0.806)
Observations	18,284	18,284	6,640	6,640
R^2	0.065	0.067	0.053	0.056
Within R^2	0.070	0.071	0.061	0.065

Notes: Baseline specifications as in Table 2, except that we do not winsorize the survey variables. Standard errors are clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1.

(b) dropping top and bottom 1% of survey variables

	Forecast error about firm's own prices			
	(1)	(2)	(3)	(4)
Micro News				
Forecast revision for $\pi^i_{t+4,t}$ (no outliers)	-0.348^{***}		-0.347^{***}	
	(0.016)		(0.033)	
Forecast revision for $\pi^i_{t+4,t}$ net of $\gamma_i \Delta\pi_t$ (no outliers)		-0.339^{***}		-0.320^{***}
		(0.016)		(0.032)
Macro News				
Forecast revision for $\pi_{t+4,t}$ (no outliers)	0.245^{***}	0.222^{***}		
	(0.038)	(0.037)		
Inflation surprise			2.506^{***}	2.424^{***}
			(0.313)	(0.312)
Observations	17,634	17,587	6,445	6,426
R^2	0.053	0.048	0.057	0.050
Within R^2	0.061	0.055	0.070	0.060

Notes: Baseline specifications as in Table 2, except that we drop the bottom and top 1% of survey variables (rather than winsorizing at these values). Standard errors are clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.5: Additional regression results from the SIGE, continued

(c) alternative definitions of micro news

	Forecast error about firm's own prices			
	(1)	(2)	(3)	(4)
Micro News				
Forecast revision for $\pi^i_{t+4,t}$ net of time-fixed effects	-0.441^{***}		-0.443^{***}	
	(0.018)		(0.031)	
Forecast revision for $\pi^i_{t+4,t}$ net of $\gamma\Delta\pi_t$		-0.424^{***}		-0.423^{***}
		(0.018)		(0.031)
Macro News				
Forecast revision for $\pi_{t+4,t}$	0.212^{***}	0.259^{***}		
	(0.050)	(0.050)		
Inflation surprise			2.564^{***}	2.967^{***}
			(0.409)	(0.404)
Observations	18,284	18,284	6,640	6,640
R^2	0.078	0.072	0.082	0.074
Within R^2	0.087	0.081	0.097	0.090

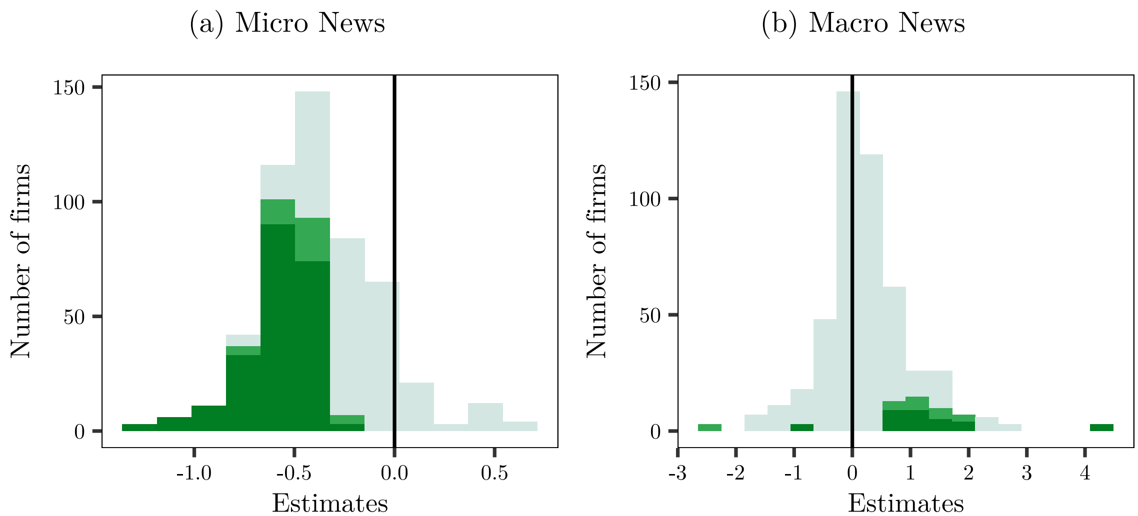
Notes: Specifications as in Table 2, using alternative definitions of news. Column (1) purges firms' forecast revisions of time-fixed effects. Column (2) purges forecast revisions of recent changes in inflation with homogeneous loading γ (instead of γ_i). In both columns, macro news is a firm's forecast revision for inflation. Columns (3) and (4) use inflation surprises as macro news, micro news as in Columns (1) and (2). Standard errors are clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1.

(d) Univariate results

	Forecast error about firm's own prices					
	(1)	(2)	(3)	(4)	(5)	(6)
Micro News						
Forecast revision for $\pi^i_{t+4,t}$	-0.417^{***}					
	(0.019)					
Forecast revision for $\pi^i_{t+4,t}$ net of $\gamma_i\Delta\pi_t$		-0.412^{***}				
		(0.018)				
Macro News						
Forecast revision for $\pi_{t+4,t}$			0.150^{***}			
			(0.055)			
Inflation surprise				2.756^{***}		
				(0.401)		
Forecast revision for $\pi_{t+4,t}$ (6m v 12m)					0.264^{***}	
					(0.056)	
Forecast revision for $\pi_{t+4,t}$ (12m v 24m)						0.157^{***}
						(0.046)
Observations	18,284	18,284	18,284	7,196	9,486	9,754
R^2	0.068	0.067	0.001	0.015	0.009	0.005
Within R^2	0.078	0.077	0.001	0.013	0.006	0.003

Notes: Univariate versions of the baseline specification. Firm-fixed effects are always included. Standard errors are clustered at the firm level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure A.2: Firm-level regressions



Notes: We estimate our baseline specification (micro and macro news are firms' forecast revisions (first difference) for changes in their own prices and aggregate inflation, respectively) for each firm separately and show the univariate distribution of firm-level news coefficients. Grey area represents insignificant estimates, light green area represents estimates significant at the 10% level, dark green area indicates significance at the 5% level. Bars with less than three observations per group are not shown due to confidentiality.

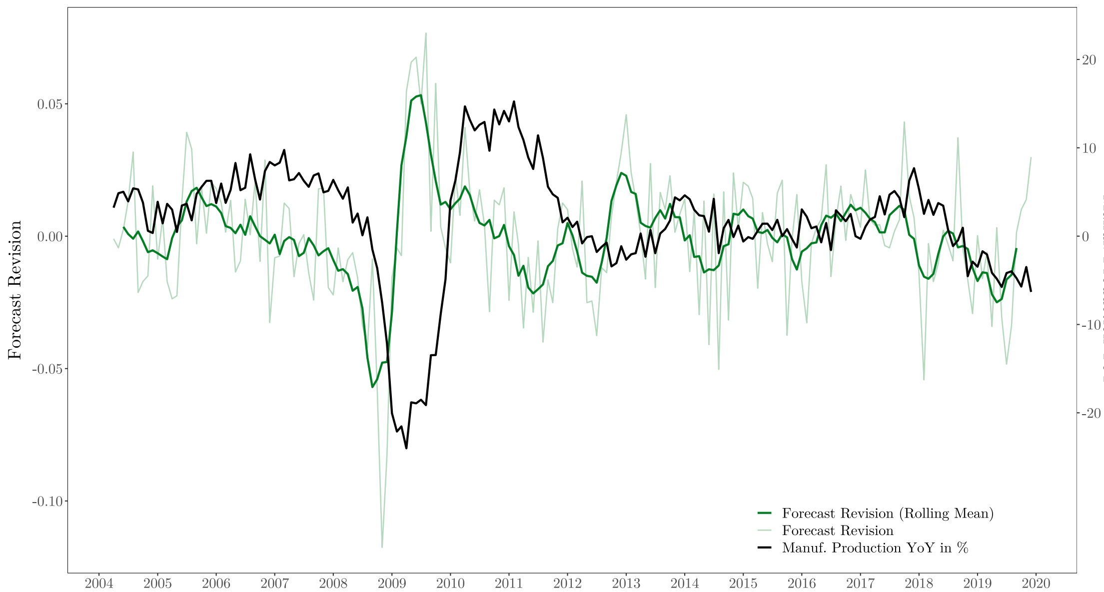
A.3 ifo Business Climate Survey

Table A.6: Relevant questions from ifo survey

Label	Name	Question	Possible answers
Q1	Expected state of business (qualitative)	Plans and Expectations for the next 6 months: Our business situation will be	rather more favorable [1] not changing [0] rather less favorable [-1]
Q2	Expected state of business (quantitative)	Expectations for the next 6 months: In cyclical regards our state of business will be	slider with range 0 [be rather less favorable] to 100 [rather more favorable]
Q3	Realized state of business (qualitative)	Current situation: We evaluate our state of business to be	good [1] satisfiable [0] bad [-1]
Q4	Realized state of business (quantitative)	Current situation: We consider our state of business to be	slider with range good [100] to bad [0]
Q5	Realized production	Review - tendencies in [t-1]: Compared to [t-2] our production	increased [1] stayed about the same [0] decreased [-1]
Q6	Expected production	Plans and Expectations for the next 3 months: Our production is expected to be	increasing [1] not changing [0] decreasing [-1]
Q7	Macro importance	How important is the general economic development in Germany for your business situation?	very important [1] important [2] not as important [3] less important [4] unimportant [5]

Notes: Most recent wording of relevant questions from the ifo survey taken from the EBDC Questionnaire manual. t denotes the month of the survey, so in July Q5 asks about the change in June compared to May.

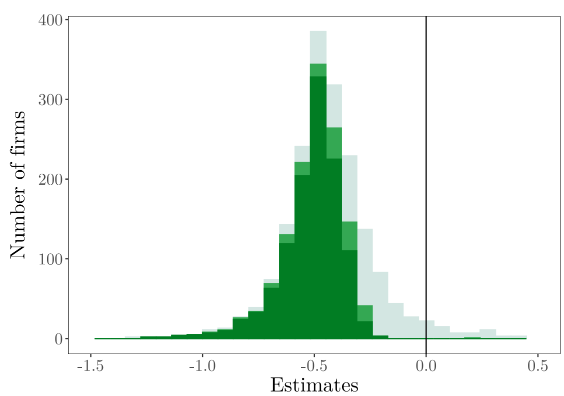
Figure A.3: Average forecast revisions and production growth



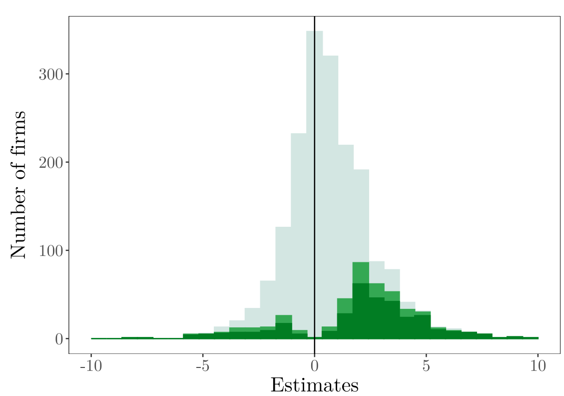
Notes: Figure displays the average, seasonally adjusted forecast revision (rolling mean over 6 months) in green and year-on-year growth of manufacturing production in black (administrative data).

Figure A.4: Distribution of firm-level responses to news

(a) Business expectations: micro



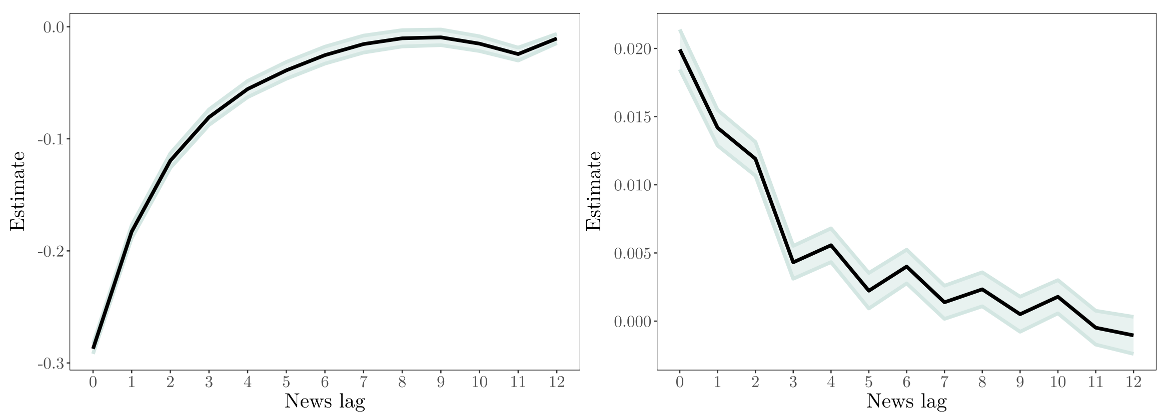
(b) Business expectations: macro



Notes: The figure shows results for expectations about firms' business situation (6-month horizon, quantitative data). Grey area represents insignificant estimates, light green area represents estimates significant at the 10% level, dark green area indicates significance at the 5% level.

Figure A.5: Response to concurrent and lagged news

(a) Response to lagged micro news (b) Response to lagged macro response



Notes: Estimates based on Equation (2). Black lines represent point estimates, grey areas correspond to 95% confidence intervals.

Table A.7: Macro news and forecast revisions

	$\widehat{\beta}$	$SE(\widehat{\beta})$
Macro News	0.008	0.001
Macro News		
× 1. Quartile by employees	0.007	0.002
× 2. Quartile by employees	0.008	0.002
× 3. Quartile by employees	0.008	0.002
× 4. Quartile by employees	0.008	0.001
Macro News		
× Firm age $<$ 20 years	0.007	0.003
× Firm age $\geq$ 20 years	0.006	0.001
Macro News		
× Time in survey $<$ half a year	0.015	0.007
× Time in survey $\geq$ half a year	0.008	0.001
Macro News		
× Low business-cycle exposure	0.005	0.002
× Medium business-cycle exposure	0.008	0.002
× High business-cycle exposure	0.006	0.003

Notes: Reaction of forecast revisions to macro news. Firms' forecast revisions are regressed on macro news, interaction terms, and firm-fixed effects for each interaction variable separately. For (quartiles of) the number of employees, we rely on annual questions in the ifo survey. For firm age, we rely on a one-time question about the year the firm was founded. To compute the firm age, we subtract from the year of response the year of foundation. For business-cycle exposure, we rely on a one-time question, where firms rank the importance of general economic developments in Germany for their business on a five-point scale from very important [1] to unimportant [5]. Business-cycle exposure is high when the response was very important [1], medium when the response was important [2], and low otherwise [3-5]. Standard errors are clustered at the firm level.

Table A.8: Production expectations—robustness

	Variation	Details	Micro coeff.	Macro coeff.
1)	Micro news (forecast revisions)			
	Use only revisions from zero	Table A.11a	-0.110^{***}	0.030^{***}
	As above and set small errors ($\pm\frac{1}{3}$) to zero	Table A.11b	-0.086^{***}	0.023^{***}
2)	Forecast error (Bachmann et al. 2013)			
	Set small errors ($\pm\frac{1}{3}$) to zero	Table A.11c	-0.128^{***}	0.018^{***}
	Above only for no-change expectations	Table A.11d	-0.192^{***}	0.018^{***}
3)	Estimation (OLS)			
	Ordered logit	Table A.11e	-1.24^{***}	0.11^{***}
4)	Macro component of forecast revision (real-time indicators)			
	Fixed effect by time	Table A.11f	-0.194^{***}	0.021^{***}
	Fixed effect by time and sector	Table A.11g	-0.196^{***}	0.021^{***}
5)	Macro news (surprise component in ifo index)			
	Surprise component in manuf. orders	Table A.11h	-0.208^{***}	0.005^{***}
	First difference of ifo index	Table A.11i	-0.208^{***}	0.002^{***}
	Average forecast revision	Table A.11j	-0.209^{***}	0.345^{***}
	Average forecast revision by sector[a]	Table A.11k	-0.211^{***}	0.216^{***}
	First difference of stock market index	Table A.11l	-0.208^{***}	0.328^{***}

Notes: Each row corresponds to a variation of the specification for which we report results in Table 4, see Appendix A.3 for details. Micro coefficient and macro coefficient are the estimates on micro and macro news. [a] In this specification, macro news is the time and sector average. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A.9: Business situation as outcome variable (ifo survey)

	Firms' forecast errors about their business situation			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+6,t}$	-0.441***			
	(0.004)			
Forecast Revision for $y^i_{t+6,t}$ net of $\gamma_i \Gamma_t$		-0.453***	-0.450***	
		(0.004)	(0.004)	
Macro News				
Surprise component of the ifo index	0.857***	0.795***		0.697***
	(0.044)	(0.044)		(0.044)
Observations	153,398	153,398	153,398	153,398
R^2	0.31864	0.30652	0.30357	0.25466
Within R^2	0.08861	0.07240	0.06845	0.00303

Notes: Results based on Equation (1); observations are pooled across firms. The table shows results for the quantitative business expectations (6-month horizon) for German firms as surveyed monthly in the ifo survey. Macro news is the surprise component of the ifo index. Column (1): micro news measured by forecast revisions (while controlling for macro news). Columns (2) and (3): micro news represents forecast revisions net of real-time observable aggregate developments, measured by macroeconomic indicators Γ_t with idiosyncratic reaction coefficient γ_i (see Footnote 32 for more details). All specifications include firm-fixed effects. Standard errors are clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.10: Prices as outcome variable (ifo survey)

	Firms' forecast errors about their price			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $p^i_{t+3,t}$	-0.175***			
	(0.001)			
Forecast Revision for $p^i_{t+3,t}$ net of $\gamma_i\Gamma_t$		-0.186***	-0.185***	
		(0.001)	(0.001)	
Macro News				
Surprise component of the ifo index	0.010***	0.009***		0.009***
	(0.0005)	(0.0005)		(0.0005)
Observations	298,400	298,400	298,400	298,400
R^2	0.15826	0.14937	0.14746	0.07552
Within R^2	0.09112	0.08151	0.07945	0.00178

Notes: Results based on Equation (1); observations are pooled across firms. The table shows results for the qualitative price expectations (3-month horizon) for German firms as surveyed monthly in the ifo survey. Macro news is the surprise component of the ifo index. Column (1): micro news measured by forecast revisions (while controlling for macro news). Columns (2) and (3): micro news represents forecast revisions net of real-time observable aggregate developments, measured by macroeconomic indicators Γ_t with idiosyncratic reaction coefficient γ_i (see Footnote 32 for more details). All specifications include firm-fixed effects. Standard errors are clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.11: Alternative specifications

(a) Expectations: only no-change forecasts

	Firms' forecast errors about their production (1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.091***			
	(0.003)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_i \Gamma_t$		-0.110***	-0.112***	
		(0.003)	(0.003)	
Macro News				
Surprise component of the ifo index	0.030***	0.030***		0.030***
	(0.0008)	(0.0008)		(0.0009)
Observations	205,962	205,962	205,962	205,962
R^2	0.17355	0.17605	0.16728	0.16331
Within R^2	0.02310	0.02605	0.01569	0.01100

Notes: Set-up as in Table 4, except that we only use observations where firms expect no production change. Firm-fixed effects are always included. Standard errors are clustered at firm level. *** p<0.01, ** p<0.05, * p<0.1.

(b) Expectations: only no-change forecasts and small errors set to zero

	Firms' forecast errors about their production (1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.072***			
	(0.002)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_i \Gamma_t$		-0.086***	-0.088***	
		(0.002)	(0.002)	
Macro News				
Surprise component of the ifo index	0.024***	0.023***		0.024***
	(0.0008)	(0.0008)		(0.0008)
Observations	205,962	205,962	205,962	205,962
R^2	0.14081	0.14270	0.13592	0.13288
Within R^2	0.01729	0.01945	0.01170	0.00823

Notes: Set-up as in Table 4, except that we only use observations where firms expect no production change and set small forecast errors ($\pm\frac{1}{3}$) to zero. Firm-fixed effects are always included. Standard errors are clustered at firm level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.11: Alternative specifications, continued.

(c) Forecast error: small errors set to zero

	Firms' forecast errors about their production			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.115***			
	(0.001)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_i \Gamma_t$		-0.128***	-0.128***	
		(0.002)	(0.002)	
Macro News				
Surprise component of the ifo index	0.018***	0.018***		0.018***
	(0.0006)	(0.0006)		(0.0006)
Observations	302,737	302,737	302,737	302,737
R^2	0.11352	0.11278	0.10838	0.07974
Within R^2	0.04103	0.04022	0.03547	0.00449

Notes: Set-up as in Table 4, except small forecast errors ($\pm\frac{1}{3}$) are set to zero. Firm-fixed effects are always included. Standard errors are clustered at firm level. *** p<0.01, ** p<0.05, * p<0.1.

(d) Forecast error: small errors set to zero if no change expected

	Firms' forecast errors about their production			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.176***			
	(0.001)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_j \Gamma_t$		-0.192***	-0.191***	
		(0.001)	(0.001)	
Macro News				
Surprise component of the ifo index	0.018***	0.018***		0.017***
	(0.0006)	(0.0006)		(0.0006)
Observations	302,737	302,737	302,737	302,737
R^2	0.14684	0.14143	0.13768	0.07495
Within R^2	0.08113	0.07529	0.07125	0.00369

Notes: Set-up as in Table 4, except that we set small forecast errors ($\pm\frac{1}{3}$) to zero when expectations are zero. Firm-fixed effects are always included. Standard errors are clustered at firm level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.11: Alternative specifications, continued.

(e) Estimation: Ordered Logit rather than OLS

Term	Estimate	Standard Error	t-value	Coeficient type	exp(estimate)
Micro News	-1.24	0.01	-158.19	coefficient	0.29
Macro News	0.11	0.00	37.16	coefficient	1.12
-4/3|-1	-6.04	0.03	-173.89	scale	0.00
-1|-2/3	-3.56	0.01	-337.00	scale	0.03
-2/3|-1/3	-2.45	0.01	-370.14	scale	0.09
-1/3|0	-1.27	0.00	-280.89	scale	0.28
0|1/3	1.52	0.00	314.78	scale	4.57
1/3|2/3	2.71	0.01	373.96	scale	15.10
2/3|1	3.91	0.01	321.66	scale	49.88
1|4/3	6.66	0.05	144.17	scale	782.37

Notes: Results using ordered logit to estimate the effect of micro news and macro news on the production forecast error. The last column shows the odds ratios. Rows 3 to 10 depict the cut points of the latent variable. The full, pooled sample is used.

(f) Micro news: absorb macro component of forecast revision with time-fixed effect

	Firms' forecast errors about their production			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.191***			
	(0.001)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_i \Gamma_t$		-0.194***	-0.194***	
		(0.001)	(0.001)	
Macro News				
Surprise component of the ifo index	0.022***	0.021***		0.021***
	(0.0007)	(0.0007)		(0.0007)
Observations	302,737	302,737	302,737	302,737
R^2	0.16260	0.16471	0.16015	0.08967
Within R^2	0.08471	0.08701	0.08202	0.00498

Notes: Set-up as in Table 4, except that we absorb the macro component from forecast revisions by means of time-fixed effects. Firm-fixed effects are always included. Standard errors are clustered at firm level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.11: Alternative specifications, continued.

(g) Micro news: absorb macro comp. of forecast revision with time-sector-fixed effect

	Firms' forecast errors about their production			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.191***			
	(0.001)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_i \Gamma_t$		-0.196***	-0.196***	
		(0.001)	(0.001)	
Macro News				
Surprise component of the ifo index	0.022***	0.021***		0.021***
	(0.0007)	(0.0007)		(0.0007)
Observations	302,737	302,737	302,737	302,737
R^2	0.16260	0.16555	0.16100	0.08967
Within R^2	0.08471	0.08793	0.08295	0.00498

Notes: Set-up as in Table 4, except that we absorb the macro component from forecast revisions by means of time-sector-fixed effects. Firm-fixed effects are always included. Standard errors are clustered at firm level. *** p<0.01, ** p<0.05, * p<0.1.

(h) Macro news: manufacturing orders rather than ifo index

	Firms' forecast errors about their production			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.190***			
	(0.001)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_i \Gamma_t$		-0.208***	-0.208***	
		(0.001)	(0.001)	
Macro News				
Surprise component of the ifo index	0.005***	0.005***		0.005***
	(0.0003)	(0.0003)		(0.0003)
Observations	298,586	298,586	298,586	298,586
R^2	0.15828	0.15383	0.15286	0.08580
Within R^2	0.08023	0.07536	0.07431	0.00103

Notes: Set-up as in Table 4, except macro news is constructed from the median professional forecast of manufacturing orders. Firm-fixed effects are always included. Standard errors are clustered at firm level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.11: Alternative specifications, continued.

(i) Macro news: first difference of ifo index rather than ifo index surprise

	Firms' forecast errors about their production			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.190***			
	(0.001)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_i\Gamma_t$		-0.208***	-0.208***	
		(0.001)	(0.001)	
Macro News				
Surprise component of the ifo index	0.002***	0.002***		0.001***
	(0.0002)	(0.0003)		(0.0003)
Observations	301,185	301,185	302,737	301,185
R^2	0.15737	0.15318	0.15313	0.08505
Within R^2	0.07908	0.07450	0.07435	0.00004

Notes: Set-up as in Table 4, except macro news is constructed with the first difference of the ifo index. Firm-fixed effects are always included. Standard errors are clustered at firm level.
*** p<0.01, ** p<0.05, * p<0.1.

(j) Macro news: average forecast revisions rather than ifo index

	Firms' forecast errors about their production			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.194***			
	(0.001)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_i\Gamma_t$		-0.209***	-0.208***	
		(0.001)	(0.001)	
Macro News				
Surprise component of the ifo index	0.502***	0.345***		0.308***
	(0.019)	(0.018)		(0.018)
Observations	302,737	302,737	302,737	302,737
R^2	0.16186	0.15526	0.15313	0.08681
Within R^2	0.08389	0.07668	0.07435	0.00187

Notes: Set-up as in Table 4, except macro news is constructed with average production forecast revisions. Firm-fixed effects are always included. Standard errors are clustered at firm level.
*** p<0.01, ** p<0.05, * p<0.1.

Table A.11: Alternative specifications, continued.

(k) Macro news: average forecast revisions for each sector rather than ifo index

	Firms' forecast errors about their production			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.196***			
	(0.001)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_i \Gamma_t$		-0.211***	-0.208***	
		(0.001)	(0.001)	
Macro News				
Surprise component of the ifo index	0.326***	0.216***		0.129***
	(0.013)	(0.011)		(0.012)
Observations	302,737	302,737	302,737	302,737
R^2	0.16169	0.15506	0.15313	0.08580
Within R^2	0.08371	0.07646	0.07435	0.00076

Notes: Set-up as in Table 4, except macro news is constructed with average production forecast revisions for each sector. Firm-fixed effects are always included. Standard errors are clustered at firm level. *** p<0.01, ** p<0.05, * p<0.1.

(l) Macro news: first difference of stock market index rather than ifo index surprise

	Firms' forecast errors about their production			
	(1)	(2)	(3)	(4)
Micro News				
Forecast Revision for $y^i_{t+3,t}$	-0.190***			
	(0.001)			
Forecast Revision for $y^i_{t+3,t}$ net of $\gamma_i \Gamma_t$		-0.208***	-0.208***	
		(0.001)	(0.001)	
Macro News				
Surprise component of the ifo index	0.371***	0.328***		0.328***
	(0.014)	(0.014)		(0.014)
Observations	302,737	302,737	302,737	302,737
R^2	0.15999	0.15518	0.15313	0.08716
Within R^2	0.08185	0.07659	0.07435	0.00224

Notes: Set-up as in Table 4, except macro news is constructed with the first difference of the German stock market index DAX. Firm-fixed effects are always included. Standard errors are clustered at firm level. *** p<0.01, ** p<0.05, * p<0.1.