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Mental Models of the Stock Market

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Abstract: Investors' return expectations are pivotal in stock markets, but the reasoning behind these expectations is not well understood. This paper sheds light on economic agents' mental models – their subjective understanding – of the stock market. We conduct surveys with the general population, retail investors, financial professionals, and academic experts. Respondents forecast and explain how future returns respond to stale news about the future earnings streams of companies. We document four main results. First, while academic experts view stale news as irrelevant, households and professionals often believe that stale good news leads to persistently higher expected future returns. Second, academic experts refer to market efficiency to explain their forecasts, whereas households and many professionals directly equate higher future earnings with higher future returns, neglecting the offsetting effects of endogenous price adjustments. Third, additional experiments with households demonstrate that this neglect of equilibrium pricing does not reflect inattention to trading or price responses or ignorance about how returns are calculated. Instead, it reflects a gap in respondents' mental models: they are unfamiliar with the concept of equilibrium pricing. Lastly, we illustrate the potential consequences of neglecting equilibrium pricing. We use panel data on household expectations to show that this neglect predicts previously documented belief anomalies such as return extrapolation and pro-cyclicality.

JEL-Codes: D83, D84, G11, G12, G41, G51, G53.

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1 Introduction

Stock markets revolve around market participants' return expectations. Return expectations shape investment decisions, disagreement about future returns generates trading, and expectation anomalies can explain important market-level phenomena such as excess volatility and bubbles (Adam and Nagel, 2023; Barberis et al., 2015, 2018; Giglio et al., 2021a). Investors' deeper understanding – their "mental model" – of the stock market will likely play a critical role in the formation of these expectations. However, conventional data on stock prices or trading decisions and even data on subjective expectations remain silent on agents' reasoning and understanding. Thus, even though agents' return expectations are pivotal in stock markets, the mental models underlying these expectations are not well understood.

In this paper, we empirically study the mental models that underlie agents' stock return expectations. We focus on agents' inference from "stale" earnings news to expected future returns. This setting allows us to distinguish between three broad classes of mental models. A model of *efficient markets* predicts that news about future expected earnings is immediately priced in and will not be informative about future expected returns. A model with *temporary mispricing* holds that the market equilibrium can temporarily deviate from efficient pricing because of under- or overreaction to news. By contrast, a model that *neglects equilibrium pricing* ignores that stock prices adjust to offset changes in expected future earnings, which means that higher expected earnings directly translate into higher expected returns.

To shed light on agents' mental models, we adopt a tailored survey-based approach that combines rich expectation data with qualitative text data on agents' reasoning. We field our survey with a diverse group of economic agents: households from the US and the German general population, US and German retail investors, US financial advisors, fund managers employed at large German asset management companies, and international academic experts. In addition, we run a series of experiments with US households to explore the roots of households' mental models, and we investigate the consequences of these models for belief formation. In total, we interview more than 18,000 households and investors.

Our empirical methodology is comparable across samples. We present participants with news scenarios that are relevant to the future earnings stream of a specific company (e.g., Nike). Participants read two alternative scenarios, one describing a relatively neutral and expected event (e.g., "Nike maintains supplier partnership"), the other describing either good or bad unexpected news (e.g., "Nike secures cost-saving partnership"). Crucially, both pieces of news are four weeks old, which means that, depending on their mental models, participants should reason very differently about the "stale" news' impact on future returns. Participants predict in which of the two scenarios the

expected future stock return of the company would be higher. Then, they explain the reasoning underlying their return forecast in a qualitative open-ended question. Lastly, they predict differences in the company's earnings and risk profile across the two scenarios. We primarily rely on hypothetical news scenarios, which allows holding constant information sets across respondents and simplifies the collection of text data on respondents' reasoning. However, we demonstrate the robustness of our approach to relying on real news items instead. We document four main results.

(1) Inference from stale news: We investigate whether respondents believe that stale news about future earnings still matters for companies' future stock returns. Few academic experts think so, with about 70% predicting no change in future returns in response to stale news. This stands in stark contrast to the forecasts of general population respondents, retail investors, and financial professionals. Across the different scenarios, 50% to 80% of the general population respondents predict higher returns over the next 12 months in response to four-week-old positive news about future earnings (and lower returns for negative news, respectively). Among retail investors and financial advisors, we observe a similar picture as in the general population samples: around 75% of retail investors and financial advisors predict higher (lower) returns in response to stale good (bad) news. Among fund managers, 51% make such "news-congruent" return forecasts.

(2) Mental models: We explore which mental models of the stock market underlie respondents' return forecasts. The open-ended question included in our survey asks respondents to explain their prediction. The responses to this question provide a direct lens into participants' reasoning, and the open-ended format ensures that respondents express what is top of their minds without being primed on any specific mechanism or argument.

Reasoning in line with market efficiency is dominant in the expert sample. For example, a typical academic expert argues that "[t]he effect on future profits and dividends should already be reflected in the current price." By contrast, respondents from the general population, retail investors, and financial advisors justify their return forecasts by referring to changes in companies' earnings, citing factors such as profit margins, sales volume, or production costs. Households and financial advisors thus directly link differences in expected future company earnings with differences in expected future returns, neglecting the equilibrium price adjustments that should have occurred over the previous four weeks. Even among fund managers, 34% express such reasoning, while the rest is mostly split between arguments referring to market efficiency or temporary mispricing due to under- or overreaction. Thus, mental models are heterogeneous not only across investor groups but also within the important group of fund managers.

We confirm these observations using two complementary approaches. A belief in market efficiency and risk-based asset pricing would imply that expectations about un-

certainty and exposure to risk factors account for differences in expected returns. This is indeed what we observe among academic experts. On the other hand, investors who neglect equilibrium pricing should predict returns to co-move with the future earnings that can be expected for the company, and this is indeed what we observe among general population respondents, retail investors, and financial advisors. Among fund managers, both predicted risk factor exposure and earnings positively co-move with return forecasts, consistent with a prevalence of both types of mental models.

Moreover, we conduct additional experimental interventions with US households that explicitly ask respondents to envision that risk exposure and uncertainty are the same across the two scenarios or that the news has already been fully priced in. If risk-based reasoning or beliefs in temporary mispricing were underlying households' forecasts, we would expect strong shifts in their return predictions in response to these interventions. Yet, neither intervention significantly reduces the proportion of respondents forecasting higher returns in response to stale news of higher future earnings. In another intervention, we increase the staleness of the news and stress that, even four weeks ago, industry experts and traders had not been surprised by the news because they had seen it coming for a long time. Yet, again, households forecast higher returns in response to (now very) stale news.

(3) Origins of neglect of equilibrium pricing: Why do so many investors directly link expected earnings to expected returns? We conduct three additional experiments with US households to understand the roots of the neglect of equilibrium pricing. One possibility is that agents are inattentive to the trading responses by other market participants and the ensuing changes in stock prices, in line with the behavioral phenomenon that indirect, contingent, and downstream consequences typically receive less attention (Bordalo et al., 2022b; Dal Bó et al., 2018; Eyster, 2019; Gabaix, 2019; Greenwood and Hanson, 2015; Niederle and Vespa, 2023). Therefore, the first experiment draws participants' attention to potential trading reactions and the ensuing price changes over the past four weeks since the news announcement. Yet, even though households report that investors traded in response to the news and that stock prices changed accordingly, their return forecasts and explanations remain unchanged. Respondents continue to make news-congruent return forecasts and to directly link expected earnings to expected returns.

This raises the question of whether households understand at all how price changes matter for future returns. In the formula for expected (gross) returns, $E_t(R_{t+1}) = E_t(P_{t+1} + D_{t+1})/P_t$, the current stock price P_t appears in the denominator. Our second experiment carefully explains the return formula to participants and walks them through its application. Yet, again, we find little effect on households' return forecasts and explanations.

It thus seems that the neglect of equilibrium pricing results from a deeper "gap" in respondents' mental models. Households acknowledge past price adjustments. However, they might not understand their meaning, namely that, in equilibrium and absent mispricing, prices adjust to rule out arbitrage opportunities and precisely offset any change in expected future earnings. To experimentally test this idea, our third experiment explains to respondents how, absent mispricing, expected future earnings are incorporated into prices in financial markets. This intervention substantially reduces the fraction predicting higher returns in response to good news by 17 percentage points. We conclude that a fundamental unfamiliarity with the concept of equilibrium is central to the neglect of equilibrium pricing.

(4) Neglect of equilibrium pricing and belief anomalies: In the final step of our analysis, we include our survey module into one wave of the Bundesbank Online Panel Households (BOP-HH) – an established panel survey on household expectations – to examine whether a neglect of equilibrium pricing predicts previously documented "anomalies" in households' real-world expectation formation. Previous work has established that households' expectations about aggregate stock returns are positively related to expected and actual overall economic growth (Amromin and Sharpe, 2013; Beutel and Weber, 2024; Giglio et al., 2021a), contrary to standard asset pricing logic. This "pro-cyclicality" could be driven by a mental model that directly links expected earnings to expected returns, neglecting equilibrium price adjustments. Moreover, many economic agents seem to extrapolate past returns (Greenwood and Shleifer, 2014; Vissing-Jorgensen, 2003). Return extrapolation is quite natural from a mental model that links expected earnings and returns: high past returns often reflect price increases due to good news about future earnings; this good news, in turn, leads agents to expect high future returns. In our data, individuals who neglect equilibrium pricing are indeed more likely to form pro-cyclical and extrapolative return expectations.

The four results of our paper are summarized in Table 1. Taken together, they highlight that heterogeneity in return expectations has deep roots in agents' mental models. Understanding these roots can help us make sense of previously documented anomalies in expectations and trading behavior. We discuss these implications below.

Implications and related literature Expectations are central in financial markets and have hence attracted a large empirical literature (Adam and Nagel, 2023). These studies have used observational survey data (Adam et al., 2017; Bordalo et al., 2019, 2024a,b; De La O and Myers, 2021; Giglio et al., 2021a,b) or experiments (Beutel and Weber, 2024; Chinco et al., 2022; Fuster and Zafar, 2023; Gorodnichenko and Yin, 2024; Haaland et al., 2023; Laudenbach et al., 2024) to understand how expectations are formed and how they affect individual- and market-level outcomes. We contribute to this literature by providing direct evidence on economic agents' reasoning – the mental models

Table 1 Overview of the results

Result	Method
(1) Inference from stale news (Section 3)	
Academic experts think that stale earnings-relevant news do not predict future stock returns. Many other investors believe they do.	Seven surveys with general population respondents, retail investors, financial advisors, fund managers, and academics. Respondents predict stock returns in scenarios with stale news.
(2) Mental models (Section 4)	
Mental models differ across investor groups and within the group of fund managers. Academic experts believe in market efficiency. Non-experts and a share of fund managers directly infer higher expected returns from higher expected earnings, thereby neglecting equilibrium pricing.	Three strategies. (a) Qualitative text data. (b) Co-movement of expectations. (c) Additional experiments with households rule out risk-based reasoning and temporary mispricing.
(3) Origins of neglect of equilibrium pricing (Section 5)	
Neither attention to past price changes nor explaining the correct return formula affects households' return expectations. There is a gap in their mental model: they do not understand equilibrium pricing.	Three experiments with households. (a) The first draws attention to past trading and price changes. (b) The second helps participants apply the return formula. (c) The third explains equilibrium pricing, "fixing" the gap in their model.
(4) Neglect of equilibrium pricing and belief anomalies (Section 6)	
Equilibrium neglect is linked to the extrapolative and pro-cyclical nature of return expectations.	We correlate equilibrium neglect with expectation anomalies in household expectation panel data.

– behind their return expectations. We show that these models do not necessarily align with prevailing economic theories, making it necessary to empirically study and uncover mental models "in the wild". In particular, households and many financial professionals struggle to grasp the consequences of equilibrium price adjustments.

This critical gap in their mental model of financial markets helps to understand a series of previously documented anomalies in expectation and trading data. We show that the neglect of equilibrium pricing is linked to the pro-cyclical and extrapolative nature of return expectations (Amromin and Sharpe, 2013; Beutel and Weber, 2024; Da et al., 2021; Giglio et al., 2021a; Greenwood and Shleifer, 2014; Vissing-Jorgensen, 2003). Equilibrium pricing neglect could also contribute to the tendency to trade on stale news (Tetlock, 2011), to over-trading (Barber and Odean, 2000; Odean, 1999), or to investors' failure to understand that dividend payout reduces stock prices (Hartzmark and Solomon, 2019). If one believes that expected future earnings indicate higher future returns, successful stock investment requires adjusting the portfolio in response to earnings news and identifying companies that are expected to achieve high earnings. This could explain (i) high perceived stock market participation costs, which discourage stock market participation (Duraj et al., 2024; Gomes et al., 2021), and (ii) a preference for active investment strategies conditional on participation (Haaland and Næss, 2023).

Mental models also help understand how agents interpret new information in information provision experiments (Beutel and Weber, 2024). Thus, mental models likely have significant downstream consequences for beliefs and behavior.

The fact that the neglect of equilibrium pricing is so widespread among retail investors and financial professionals and also occurs among professional fund management teams suggests that it could also be relevant for market-level outcomes. Our results thus strongly support theoretical work that integrates non-standard belief formation mechanisms into macro-finance models to understand asset pricing consequences (Adam and Nagel, 2023). For example, the extrapolation of returns that a neglect of equilibrium pricing could produce can lead to momentum and price reversals (Barberis et al., 2015; Cutler et al., 1991; De Long et al., 1990; Jin and Sui, 2022), while disagreement about the correct model can generate high trading volume (Barberis et al., 2018; Hong and Stein, 2007). Other studies explore the consequences of imperfect inference from equilibrium prices (Adam et al., 2017; Bastianello and Fontanier, 2024a,b; Eyster et al., 2019; Hong and Stein, 1999; Schmidt-Engelbertz and Vasudevan, 2024). For example, Bastianello and Fontanier (2024a,b) study learning from prices when market participants neglect that others do so as well. This "partial equilibrium thinking" generates overreaction, excess volatility, high trading volume, and return predictability. Imperfect inference from equilibrium prices appears highly plausible in light of our results. Moreover, since our paper primarily focuses on inferences from stale earnings news to future returns, it suggests a new mechanism that theory could explore. One intriguing implication of this mechanism is that it links earnings expectations to return expectations and can thus also link the extrapolation of fundamentals (Barberis et al., 1998; Bordalo et al., 2022a, 2024a; Hirshleifer et al., 2015) to return extrapolation.

We also contribute to recent work on the foundations of attention and model misspecification (Barron and Fries, 2024; Bordalo et al., 2023, 2022b; Charles and Kendall, 2024; Enke, 2020; Esponda et al., 2023; Gabaix, 2019; Gagnon-Bartsch et al., 2023; Graeber, 2023; Hanna et al., 2014; Schwartzstein, 2014; Schwartzstein and Sunderam, 2021). Individuals often struggle to comprehend indirect and contingent consequences (Dal Bó et al., 2018; Eyster, 2019; Greenwood and Hanson, 2015; Niederle and Vespa, 2023), here: the market's pricing response. Our mechanism experiments illustrate that this results not merely from a lack of attention but from a gap in agents' mental models: a failure to understand equilibrium pricing. We show that, if the model is misspecified and does not attribute an important role to the market response, increasing attention to this response is futile. Instead, an effective intervention needs to address the gap in individuals' mental models. Our evidence thus highlights the complementary nature of attention and mental models and emphasizes the importance of studying mental representations of the world, echoing Hirshleifer (2020) who argues that understanding mental models in financial market contexts is a critical research goal.

Indeed, a growing empirical literature explores lay economic thinking in various contexts, such as macroeconomic shocks and policies (Andre et al., 2022, 2024; Coibion et al., 2023, 2022, 2018), taxation (Stantcheva, 2021), and trade (Stantcheva, 2023). In finance, Chinco et al. (2022) document that only few investors consider an asset's correlation with consumption growth when making investment decisions; Stroebel and Wurgler (2021) and Bauer et al. (2024) study how investors reason about climate risks; Duraj et al. (2024) conduct qualitative interviews on stock market participation; Schnorpfeil et al. (2024) explore how investors' beliefs about inflation affect trading decisions; Choi and Robertson (2020), Bender et al. (2022), and Liu et al. (2022) study investment motives of retail investors; and Choi (2022) reviews the investment advice given in popular books. Our study contributes to this stream of work by directly studying investors' mental models of the stock market.

2 Empirical strategy: Measuring mental models

2.1 Three mental model types

Our goal is to understand which mental models shape agents' stock return expectations. In general, we use the term "mental model" to denote beliefs about how different variables are connected – for example, expected future returns and expected future earnings – together with the reasoning about the mechanisms underlying these relationships. We focus on inference from stale earnings news to future returns, as different mental models of the stock market suggest very different interpretations of such news.

To fix ideas, contrast two scenarios in a simple thought experiment. News about a large exchange-traded company broke *four weeks ago*. In the first scenario, the news was neutral, and the stock's expected dividend stream did not change. In the second scenario, the news was positive, promised noticeably higher future earnings for the company and, hence, a higher future dividend stream for the investor. How could agents' return expectations for an investment in the stock today – four weeks after the news broke – differ between the two scenarios? We distinguish between three broad categories of mental models.

Efficient markets and risk-based asset pricing According to this view, equilibrium asset prices fully reflect all publicly available information at any point in time (Fama, 1970). News about future expected earnings is immediately priced in. Otherwise, there would be an arbitrage opportunity, which cannot exist in equilibrium. As a result, agents who believe in market efficiency believe that expected future earnings are completely irrelevant for expected future returns. Instead, the expected return arises as a compensation for the risk properties of the stock – the

risk premium – plus the risk-free rate. As long as the stock's risk properties do not differ, the expected future return is identical across the two scenarios.

Temporary mispricing Agents who follow a model of temporary mispricing believe that arbitrage is limited and the market equilibrium can temporarily deviate from efficient pricing. The reasons can be manifold. For example, if traders are inattentive and arbitrage is limited, the market underreacts to news, prices move only slowly to the efficient price as the news spreads, and expected returns are temporarily higher in the good news scenario (Jegadeesh and Titman, 1993). By contrast, if traders become initially too optimistic after hearing the good news, the market overreacts to the news, prices overshoot, and later reverse towards the efficient price (De Bondt and Thaler, 1985). Expected returns can be higher or lower depending on the timing of market entry and the return reversal. Mispricing can also result from the behavior of fully rational agents if there are market frictions. While there are many specific models for why temporary mispricing can occur in equilibrium after earnings news arrives, they all share the idea that, in addition to the risk-free rate and the risk premium, under- or overreaction shape expected returns.

In both of the above categories, equilibrium price adjustments break any direct link between a company's future expected earnings and the future expected return of an investment in this company. By itself, the difference in expected earnings across the two scenarios is irrelevant. Instead, what matters is whether there is a difference in the risk-free rate or the risk premium and whether mispricing occurs. This stands in stark contrast to our third category.

Neglect of equilibrium pricing Agents might neglect the offsetting effect of the equilibrium price adjustments that have occurred since the news broke. When forecasting how the news affects future returns, they merely consider how the news has changed future earnings. Agents who neglect equilibrium pricing would thus predict higher future returns in the scenario with higher expected earnings. Such neglect could have different roots: (i) agents could be inattentive to the fact that the current stock price, P_t, has changed since the news; (ii) agents could fail to apply the correct return formula, according to which the return negatively depends on the current stock price, P_t; or (iii) agents might fail to understand that, absent mispricing, the change in the stock price since the news announcement precisely offsets the change in the expected future dividend stream – i.e., they might fail to understand the informational content of prices. As a consequence, agents neglecting equilibrium pricing view the question "Which stock investments can be expected to succeed?" as interchangeable with the question "Which company can

be expected to succeed?", and they directly infer higher expected returns from higher expected earnings.

The three broad categories differ in how agents reason about prices. More formally, agents who believe in efficient markets believe that prices are efficient: $P_t = P_t^*$, where $P_t^* = \frac{1}{r_f + \textit{risk premium}} E_t(D_{t+1} + P_{t+1}^*)$. Since the expected (gross) return is $E_t(R_{t+1}) = E_t(D_{t+1} + P_{t+1})/P_t$, they expect a return of $r_f + \textit{risk premium}$. Agents who believe in temporary mispricing believe that prices can deviate from the efficient prices, e.g., $P_t = \theta P_t^*$ with $\theta \neq 1$, and expect a return of $\frac{1}{\theta}(r_f + \textit{risk premium})$. Agents who neglect equilibrium pricing form their return expectations without reasoning about the current price of the asset. Instead, they directly infer future returns from future expected earnings and equate the expected success of the company with the expected success of investment in this company.

These three forms of reasoning will often yield different predictions for an asset's future expected returns, but even if they make a similar prediction, they will do so for very different reasons. For example, higher expected returns could be predicted after stale good news either because (i) an investment in the stock is now perceived to be riskier, (ii) the stock market is thought to have underreacted to the news, or (iii) the higher expected earnings are directly linked to higher expected returns.

Our broad classification of mental models is not exhaustive, but it captures the two prominent classes of models in economics and finance and a third form of reasoning, which is, as we will find, quite common in practice. These models have very different implications for how return expectations are formed, which motivates us to study their empirical prevalence.

Throughout our analysis, we do not take a stance on which reasoning about the stock market is correct. Of course, neglecting equilibrium pricing is inconsistent with economic theory (hence the term "neglect"), but even those who do so could make plausible return forecasts for the wrong reasons. Our academic expert survey consults a large number of distinguished financial economists, many of whom have contributed to the academic debate on this issue. We are not in a superior position to judge and leave it to readers to form their own conclusion.[1]

2.2 Survey design

Because the three model types interpret stale news so differently, belief formation in response to stale news is an ideal setting to study agents' mental models. Our empirical

[1]We note, however, that several recent studies suggest that earnings news does not predict future stock returns over the horizons we consider (Freyberger et al., 2020; Gu et al., 2020) and that phenomena such as post-earnings announcement drift have disappeared over the last decades for large, liquid stocks of the type considered in our scenarios (Fink, 2021; Martineau, 2022).

strategy relies on this insight, translates the above "thought experiment" into concrete terms, and implements it in tailored surveys with a diverse set of economic agents.

Scenarios In the survey, each respondent is asked to think about a pair of hypothetical scenarios: a scenario with neutral stale news and a scenario describing either positive or negative stale public news for the future earnings stream of a company. We describe the news as four weeks old.[2] We repeat this information multiple times, including in all subsequent prediction questions, and even ask for it in a comprehension quiz to ensure that the information is salient. We also highlight that the news is public and received attention. Our main scenarios describe news about Nike, the multinational athletic footwear and apparel corporation. In the condition with neutral versus good news, the scenarios read as follows:

> **Scenario 1: Nike maintains supplier partnership**
> Four weeks ago, on [. . .], Nike Inc. announced the continuation of its partnership with major polyester supplier Toray Industries Inc., in a move aimed at retaining its current supply chain. The continuation of the partnership is expected to maintain the company's current cost structure. Industry experts were not surprised by the announcement, as continuity in supplier relationships is a common practice in the industry.
>
> **Scenario 2: Nike secures cost-saving partnership**
> Four weeks ago, on [. . .], Nike Inc. announced a new strategic partnership with leading recycled polyester supplier Unifi Inc., aimed at reducing raw material costs by 20%. The deal is expected to have a significant impact on Nike's bottom line, making its products more price-competitive. Industry experts were pleasantly surprised by the news and dubbed it an "unexpected success" for the company. They projected the move to significantly enhance Nike's market position in the sports apparel industry.
>
> **In both scenarios, the announcement was made four weeks ago and received a lot of attention from stock market traders.**

An analogous survey condition contrasts neutral with *bad* news. There, Nike announced a significant disruption of its supply chain. Industry experts were negatively surprised by the news and projected that this significantly weakens Nike's market position. Respondents are randomized into one condition.

We deliberately use a real-world company and realistic business news and present them in a journalistic style to render the situation concrete, tangible, and naturalistic. Not all of our respondents are equally able to access or articulate an abstract mental

[2]The news is described as four weeks old because we want to abstract from very short-run mispricing (e.g., Medhat and Schmeling, 2022). In theory, efficient markets respond immediately, but we do not want to take a stance on what counts as "immediate" in the real world. Hence, we adopt a conservative approach: if respondents think the public news is still not fully reflected in prices four weeks later, they certainly do not believe in market efficiency.

representation of the stock market, but their underlying views and understanding become visible in concrete examples. Moreover, focusing on an individual stock rather than the aggregate market allows us to abstract from changes in the risk-free rate or risk aversion.

The hypothetical nature of the scenarios has three key advantages. First, it gives us full control over all the details of the news events. Second, it allows us to ensure comparable information sets across participants, which is crucial given the diverse background knowledge of our heterogeneous respondent groups. Third, it allows us to present each respondent with both a neutral and an alternative positive/negative news scenario, which implies that we can directly elicit our object of interest: the perceived *difference* in expected returns across the two scenarios. This approach controls for heterogeneity in the level of return expectations across individuals and samples and facilitates the open-ended elicitation of how people reason about the *effect* of stale news on future returns.

However, this approach also has potential drawbacks: respondents' reasoning could be specific to the details of the scenarios, they could find hypothetical news less credible, we cannot incentivize forecasts, and presenting each respondent with two scenarios could make respondents overly sensitive to the differences between the scenarios. These issues could be particularly relevant for respondents from the general population, who are the least familiar with the general principles governing stock markets. To address these concerns, we replicate the results in eight additional conditions with alternative scenarios in our surveys with the general population. Moreover, we demonstrate the robustness of our main result in an additional between-subject study with households that relies on real news items and incentivized return forecasts (discussed in Section 3).

Measuring expectations and reasoning After respondents have read the scenarios and passed a comprehension quiz, they are asked to envision that they invest $1,000 into the company's stock on the survey day, four weeks after the news was released. They are asked to predict whether the expected return will be higher in the first scenario, similar in both scenarios, or higher in the second scenario.[3] We focus on directional predictions (higher/similar/lower) to ensure that the question remains meaningful and answerable for groups with lower levels of financial knowledge. On the subsequent page, respondents explain their return prediction in their own words. Later, they also forecast (directional) differences in earnings, the uncertainty of the return, and the exposure to systematic risk factors for each of the next five years. In our longer surveys, we also measure directional expectations for investments made one, two, three, or four

[3]Respondents are told that "similar" indicates a return difference of at most 0.5 percentage points. At the start of the survey, all respondents receive a non-technical definition of stock returns to ensure a common understanding. We clarify that the return of a stock comprises both price changes – i.e., capital gains/losses – and dividend payments.

years in the future, and we elicit quantitative first- and second-order return expectations for the next twelve months. Appendix E.1 presents the instructions for our key survey questions. The complete instructions, including additional questions on respondents' economic background and financial literacy, are available online at https://osf.io/b83gf.

Our survey module allows us to investigate respondents' mental models through three complementary strategies. First, the expectation data enable us to document respondents' inference from stale news to future returns and to explore which models are consistent with the co-movement of respondents' return, earnings, and risk predictions. Second, the explanation data provide a direct lens into respondents' reasoning. Third, we can integrate our module into additional experiments that shed further light on people's understanding.

2.3 Samples

The final requirement for our empirical strategy is access to data from different types of economic agents. We therefore launch multiple surveys. Appendix Table B.1 provides an overview of all our data collections.

General population (US, n=2,434) We conduct our US general population survey in June and July 2023 in collaboration with the survey company Dynata. Our sample of 2,434 households closely aligns with the general US population in terms of gender, age, region, and income (Appendix Table B.2). As is common in online surveys, our sample overrepresents college-educated individuals (sample: 47%, population: 33%). 58% of our respondents report owning stocks.

General population (Germany, n=3,852) We include a condensed version of our survey in the June 2023 wave of the Bundesbank Online Panel (BOP-HH), an established panel survey on household expectations (Beckmann and Schmidt, 2020). 3,852 households with diverse background characteristics complete our module (Appendix Table B.2). Due to restrictions from the Bundesbank, we rely on fictitious company names but hold all other aspects of the scenarios constant. The German sample allows us to replicate our results in a different cultural context and to relate respondents' mental models to their real-world expectations.

Retail investors (US, n=408) To survey households who invest a substantial share of their wealth in stocks, we recruit 408 US retail investors via the survey platform Prolific in August 2023. 81% of the investors have a college degree, and 91% report an income of $100,000 or more. The median respondent holds financial assets worth $225,000, has 47% of her financial wealth invested in stocks or stock mutual funds, and conducts two equity trades per quarter (Appendix Table B.2).

Retail investors (Germany, n=299) In November and December 2023, we also recruit

299 retail investors who hold a portfolio at a large German online bank. The sample has a relatively high fraction of male respondents (88%), and the average age is 49 years. Respondents report a median financial wealth of 137,500 EUR, with 51% invested in equity, and conduct two equity trades per quarter. For comparability, we use the same fictitious company names as in the German general population survey.[4]

Financial advisors (US, n=406) In June 2023, we also survey a sample of 406 financial professionals who advise or trade for households. We collaborate with CloudResearch, a provider specializing in surveys with hard-to-reach populations, following Chinco et al. (2022). Summary statistics are displayed in Appendix Table B.2. 50% of the respondents report that providing financial advice is part of their professional activities. They advise a median number of 22 clients and have on average 10 years of experience in providing financial advice. The remaining respondents indicate trading or financial analysis among their key roles. For simplicity, we refer to this sample as our "financial advisors" sample. It reflects the base segments of the financial industry.

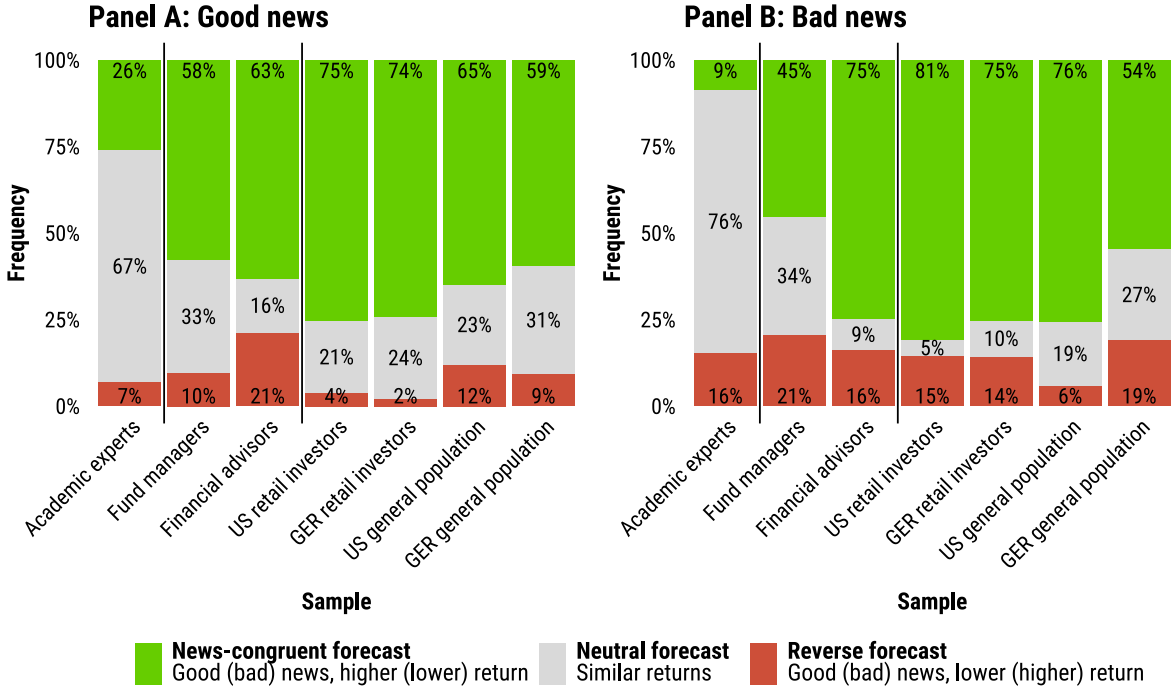
Fund managers (Germany, n=105) To survey financial professionals trading substantial amounts in the stock market, we collaborate with two large German asset management companies. For both companies, the total assets under management are in the hundreds of billions of euros. The companies agreed to distribute a shortened version of our survey among their fund management teams, which 105 respondents answered in the time between November 2023 and March 2024. We were only able to include a handful of background questions. The fund managers in our sample report an average experience of 16.2 years in their professional role. This sample reflects a population whose decisions have significant market-level implications.

Academic experts (international, n=116) In June 2023, we also invite academic economists to participate in a short version of the survey. We invite experts who have published articles with the JEL code "G: Financial Economics" in a set of leading finance journals or the "top five" economics journals between 2015 and 2019. A total of 116 experts participated in our survey. 40% of the experts are based in the United States, and 96% are male (Appendix Table B.3). On average, they completed their PhD 18.6 years before the survey. They have on average 1.7 publications in the "top five" economics journals and 4.2 publications in the "top three" finance journals. Their average Google Scholar h-index is 20.98, and their average citation count amounts to 6,594 (as of August 2023). Thus, our expert sample consists of highly experienced researchers in financial economics with significant academic impact. Their responses provide us with an academic benchmark for the forecasts elicited in our survey.

As we describe above, the surveys sometimes differ between samples due to logistical

[4]Due to the bank's data protection policies, we cannot link survey responses to administrative data on clients' investment and trading decisions.

Figure 1 Directional return expectations across samples



Notes: This figure shows the distributions of directional predictions about the difference in the expected stock return over the next 12 months between the *Nike good news* and the neutral scenario (Panel A) and between the *Nike bad news* and the neutral scenario (Panel B) in our samples of academic experts, financial professionals, retail investors, and the general population. In the surveys with German retail investors, the German general population, and some of the fund managers, the scenarios use the fictitious company name "SportsApparel" but are otherwise identical to the "Nike" scenarios.

constraints. Appendix Table B.1 provides an overview of these differences, but wherever relevant, we highlight them in table or figure notes, footnotes, or the main text.

3 Inference from stale news to future returns

This section describes the first step of our analysis: we investigate how respondents expect stale news about future earnings to affect future returns.

Figure 1 compares the expected differences in returns over the next 12 months between the bad/good news and the neutral scenario across our different samples. We focus on the main version of our survey module featuring news about Nike. Among academic experts, a large majority predict returns to be similar in the good/bad news and the neutral scenarios (67% for the good news and 76% for the bad news condition). Hence, most experts do not think stale news matters for future returns.

This strongly contrasts with the patterns observed in the other samples. Majorities of financial professionals, retail investors, and general population respondents expect returns to be higher in response to four-week-old good news about future earnings

and lower in response to four-week-old bad news. The tendency to make such "news-congruent" predictions is most pronounced among retail investors, with 75% and 81% of US retail investors (74% and 75% of German retail investors) making news-congruent forecasts in the good and bad news arms, respectively. However, the fractions are also large among fund managers (58% and 45%), financial advisors (63% and 75%), US general population respondents (65% and 76%), and German general population respondents (59% and 54%).[5,6]

The return differences expected by non-experts are quantitatively meaningful and long-lived. We draw on additional expectation data from the longer household and financial advisor surveys to illustrate this. For instance, US retail investors on average anticipate Nike's stock return to be 3.7pp higher over the next year in response to four-week-old good news and 7.3pp lower in response to bad news (Appendix Figure A.1). A considerable portion of non-experts continue to make news-congruent forecasts for returns one (56% to 65%), two (44% to 46%), three (30% to 40%), or four years (29% to 40%) into the future (Appendix Figure A.2).

Moreover, Figure 2 shows that this tendency extends to various other scenario conditions that we included in the US general population survey to explore the robustness of our results. Most respondents infer higher future returns from past good news (or lower returns from past bad news) in scenarios that feature a successful expansion of Amazon in Africa, Amazon's surprising withdrawal from South America, Novartis' harmful loss of a patent suit, or a break-through in the development of a new cancer drug by the German pharmaceutical company Biontech.[7] Households' tendency to equate higher company earnings with higher stock returns also carries over to the *aggregate* stock market. In four scenarios featuring macroeconomic news, majorities of respondents expect returns of the US stock market to be lower following four-week-old bad news, namely the announcement of an oil price or interest rate increase. Conversely, they expect the stock market to yield predictably higher returns following stale good news, namely a government spending program or a break-through in solar technology.

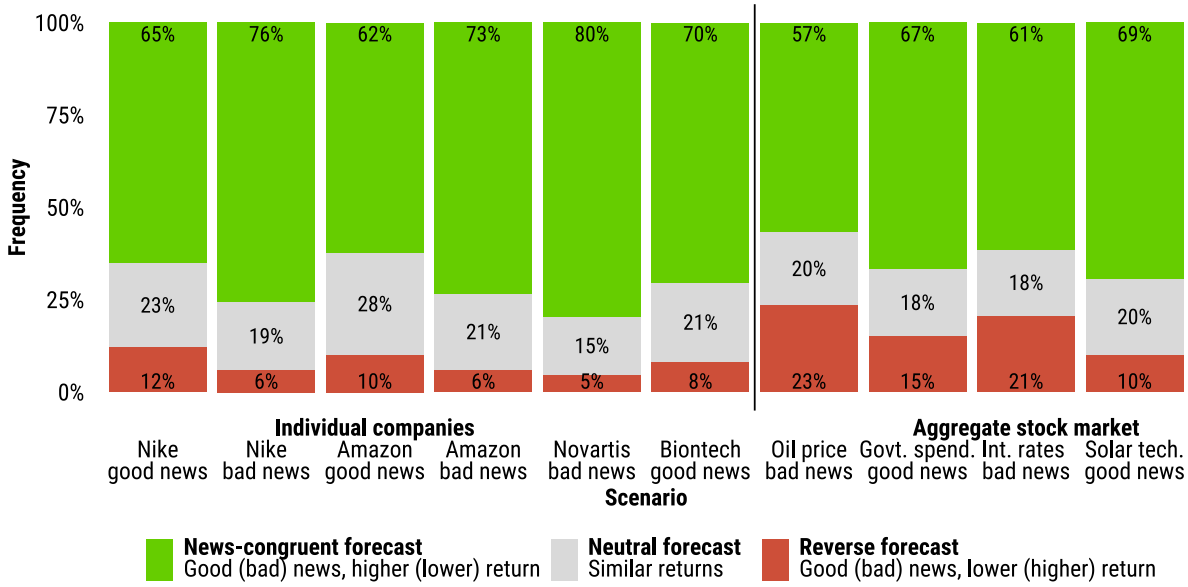
Extension: A survey with real news Finally, we confirm our results in an additional robustness study that relies on real news, a between-subject design, and incentives

[5]We think that the lower fraction of news-congruent forecasts in the German general population sample mainly reflects higher response noise. The BOP-HH survey is a taxing survey with many technical questions, and in our short module, we could not include a comprehension quiz. Consistent with this, we see in our US sample that more attentive households – proxied, e.g., by a longer survey duration or no mistakes in the comprehension quiz – make *more* news-congruent forecasts.

[6]We also examine how the return forecasts of non-experts vary with their background characteristics (see Appendix Table B.6). Most importantly, a higher level of financial literacy – as measured with the "Big 3" questions commonly used in the literature (Lusardi and Mitchell, 2014) – is associated with a *stronger* tendency to expect future returns to move into the direction of stale earnings news.

[7]We find similar patterns in the corresponding scenarios in the German general population survey, which use fictitious company names. These results are omitted for brevity but are available upon request.

Figure 2 Directional return forecasts across scenarios



Notes: This figure shows the distributions of directional predictions about the difference in the expected stock return over the next 12 months between a good/bad news and a neutral scenario. The six bars on the left focus on firm-level news and company stocks, while the four bars on the right focus on aggregate news and the US stock market. The samples consist of respondents from the US general population.

(Prolific, n=484 US households, September 2023).[8] Here and later in the paper, we provide only short summaries of our additional experiments for the sake of brevity and refer to additional material in parentheses or footnotes.

We use real news about the German company Siemens Energy. Half of the respondents are randomly assigned to the good news condition and learn that Siemens Energy announced a $7bn wind power deal four months ago. The other half of the respondents are assigned to the bad news condition and instead learn that, two months ago, Siemens Energy retracted its profit forecast for the ongoing year due to complications in its wind turbine business. Subsequently, all respondents make an incentivized quantitative forecast about the return of the Siemens Energy stock over the next 12 months. Then, they are asked to divide an investment of £100 into Siemens Energy stock and a savings bond that pays a fixed interest rate of 2%, knowing that ten respondents will be selected randomly to be paid according to their choices 12 months later.[9] Respondents assigned to the good news condition predict a 6.4pp higher return of the Siemens Energy stock over the next 12 months ($p < 0.001$), and they invest a 26.7pp higher share into the Siemens Energy stock ($p < 0.001$, Appendix Table B.7) than those in the bad news condition. These findings show (i) that our main result replicates in a between-subject design featuring real news and incentives and (ii) that households act on their

[8]The summary statistics for this experiment are shown in Appendix Table B.4. Our sample is balanced across the two included treatment arms (see Appendix Table B.5). The survey instructions are in Appendix E.2.

[9]The UK-based survey company Prolific pays US respondents in Pounds.

return forecasts by allocating significantly more money to a company's stock depending on which piece of stale news they have been exposed to.

Conclusion Taken together, our first main result is the following:

> **Result 1.** Most households, retail investors, and financial professionals consider stale positive or negative news regarding future company earnings to be predictive of correspondingly higher or lower future stock returns. By contrast, the overwhelming majority of academic experts do not consider such news to be predictive of future returns.

The strong differences in return expectations between academic experts and other investors suggest very different reasoning about how returns arise in markets. While experts' predictions are consistent with the view that stock markets are mostly efficient, households and professionals could, for example, believe in (large) temporary mispricing or neglect equilibrium pricing altogether and directly equate earnings with returns. We distinguish between these different lines of reasoning in the next section.

4 Mental models underlying return forecasts

To explore the mental models underlying respondents' return forecasts, we follow three different approaches. We collect direct measures of reasoning, we analyze the comovement of expectations about different variables, and we conduct experimental interventions. We focus on three broad classes of mental models: market efficiency and standard risk-based pricing, temporary mispricing, and a neglect of equilibrium pricing.

4.1 Respondents' reasoning

Our first approach exploits our direct measure of the reasoning behind respondents' return expectations. After respondents have made their forecast about the difference in stock returns between the two scenarios, they explain why they made their prediction in an open-text field. Compared to more structured question formats, open-ended questions offer a lens into respondents' reasoning without priming them on any potential line of thought. They do not restrict responses to pre-defined options and allow participants to express their thoughts freely and unconstrained by the researcher (Andre et al., 2024; Ferrario and Stantcheva, 2022).

Example responses Even a quick glance at the qualitative data reveals that academic experts, on the one hand, and respondents from the general population, retail investors, and financial advisors, on the other hand, reason very differently about the effect of

stale news. Experts tend to invoke the idea of *market efficiency*, as illustrated by the following response:

> "The effect on future profits and dividends should already be reflected in the current price."

Many experts additionally explain that differences in exposure to systematic risks should be the only source of differences in expected returns:

> "In efficient markets, the information should be fully incorporated into the stock price four weeks after the announcement. Thus, going forward Nike will earn its expected return which is the same in both scenarios (as beta did not change due to the announcement)."

By contrast, respondents from the general population tend to invoke differences in company earnings to justify their return forecasts. They directly link stale changes in expected earnings to changes in expected returns, neglecting the offsetting effect of equilibrium price adjustments:

> "[. . .] In scenario 2, a disruption in their supply chain would lead to difficulty in maintaining production and therefore income and therefore profits."

The following general population respondent even refers to stock price changes since the announcement but still expects higher future dividends to lead to higher returns:

> "Because although the market had already increased the stock price on the announcement the profit margins would be higher and thus dividends."

Retail investors and financial advisors tend to follow similar lines of reasoning as households in the general population sample, as exemplified by the following responses:

> "Because Nike will continue a positive relationship with its partner and therefore the company can continue to grow profits, increasing the value of the stock."
>
> "Cost savings of 20% will increase the bottom line of Nike, and therefore increase EPS for the company. I expect my $1000 investment to also increase as a result."

As we will see, fund managers' responses are very heterogeneous, but even some fund managers explain changes in expected returns with changes in expected earnings:

> "Based on the – so far – available information I would expect that lower production cost should lead to higher earnings on company side and as such increase total return of the investment."

The contrast between references to market efficiency among academic experts and the neglect of equilibrium pricing among many non-experts also becomes apparent in a simple quantitative text analysis. The word clouds in Appendix Figure A.3 display the most commonly used words for each sample. Academic experts often use words such as "price", "information", "already", or "incorporated". Households and financial advisors talk more often about "costs", "profit", "supply chain", or "product"; that is, they talk about the expected future earnings stream to justify their prediction for future expected returns. Among fund managers, both sets of terms appear frequently.

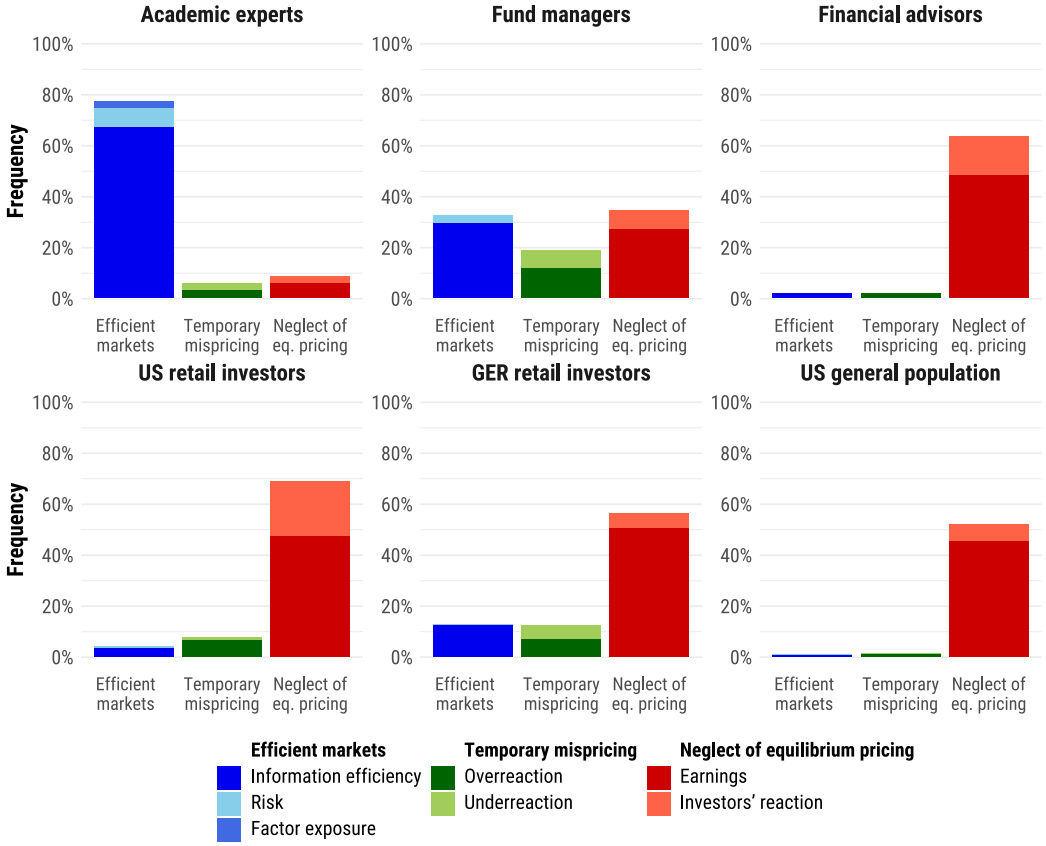
Coding scheme We devise a coding scheme to systematically compare the fractions of responses expressing arguments in line with specific mental models. Trained human coders assign each response to a unique code depending on which line of reasoning the respondent expresses.[10] Our codes encompass references to (i) market efficiency, (ii) changes in uncertainty, (iii) changes in exposure to risk factors, (iv) temporary overreaction of stock prices, (v) temporary underreaction, (vi) changes in expected earnings, and (vii) a change in traders' sentiment, excitement, or outlook for the company. Responses that cannot clearly be assigned to one category are assigned to a residual category. Codes (i)–(iii) describe arguments in line with the notion of efficient markets and standard risk-based asset pricing. Codes (iv) and (v) capture arguments related to temporary mispricing. Codes (vi) and (vii) capture arguments that neglect equilibrium pricing: higher expected earnings or the improved outlook among traders are equated with higher expected returns, neglecting the offsetting effect of price adjustments. The coding scheme and procedure are explained in more detail in Appendix D.2.

A natural limitation of our classification procedure is that we can only detect and categorize reasoning that respondents describe explicitly. However, it is plausible that respondents share what is top of their minds and important for their predictions, in particular for academics and professionals who can use professional language. Sections 4.2 and 4.3 present two complementary approaches that do not require our respondents to be able to articulate their reasoning, which should alleviate any remaining concern.

Results Figure 3 displays the distribution of open-ended responses in our main Nike scenarios, categorized with our coding scheme. We can categorize 93% of the responses from the academic expert sample using our coding scheme, compared to 87%

[10]The coding scheme was devised before the main data collection and was informed by both pilot surveys with households and leading asset pricing theories. We work with human coding because we expect that trained humans can more reliably detect the sometimes subtle economic logic in respondents' explanations than general large language models. An important drawback of human coding is its subjectivity. To address this concern, each coder has economics training and participates in a series of joint training sessions in which we introduce the coding scheme and discuss various examples. Moreover, each response is double-coded by two independent reviewers. Whenever a conflict occurs, the case is revisited by a third coder, and a final decision is made. We observe a high inter-rater reliability: when one reviewer assigns a specific code, there is a 73% chance that the other coder does so as well.

Figure 3 Reasoning underlying return forecasts across samples



Notes: This figure displays the distributions of reasoning underlying respondents' return forecasts as expressed in the open-ended question and categorized using our coding scheme. We pool across the *Nike good news* and the *Nike bad news* survey arms. The underlying samples are academic experts, fund managers, financial advisors, US and German retail investors, and the US general population sample. In the survey with German retail investors and for part of the fund managers, the scenarios use the fictitious company name "SportsApparel" but are otherwise identical to the "Nike" scenarios. The German general population survey does not include an open-ended question on reasoning due to space constraints.

among fund managers, 68% among financial advisors, and 69% among households. The smaller fractions in the non-expert samples reflect that non-expert responses are often less precise and harder to classify. We instructed the coders to be conservative and to err on the side of avoiding misclassification.

Among academic experts, 77% argue in line with efficient markets and standard risk-based asset pricing. Merely 6% attribute their return forecast to temporary over- or underreaction of stock prices. Only 9% are classified as neglecting equilibrium pricing by directly linking their return forecasts to changes in future corporate earnings.

In stark contrast, 52% of households in the US general population sample make arguments that neglect equilibrium pricing and explain their return forecast with changes in expected earnings or investors' excitement about the company outlook. Arguments in line with market efficiency or temporary mispricing are almost absent in this sample. The fact that respondents do not mention changes in risk factor exposure when making return forecasts is striking, given the central role of risk factors in contemporary asset

pricing models.[11] We find the same dominance of the neglect of equilibrium pricing among US and German retail investors (69% and 56%, respectively) and among financial advisors (64%), whereas arguments referring to market efficiency or temporary mispricing are almost absent. Within these samples, more financially literate respondents tend to be – if anything – *more* likely to express arguments reflecting a neglect of equilibrium pricing (Appendix Table B.8). This suggests that thinking about equilibrium reflects a facet of financial knowledge that is not captured by the financial literacy measures typically employed in the literature (Lusardi and Mitchell, 2014).[12]

The patterns in the fund manager sample are quite diverse. About 33% of respondents invoke market efficiency, while arguments referring to temporary mispricing are also common at 19%. However, even in this sample of experienced professional traders, who make high-stakes investment decisions, 35% express reasoning that directly links differences in expected earnings to differences in expected returns.[13]

Linking reasoning and return expectations Finally, we also investigate the correlation between respondents' reasoning and their return forecasts. We regress a dummy variable indicating whether the respondent makes a news-congruent return prediction for the next 12 months (higher returns for stale good news, lower returns for stale bad news) on dummies indicating whether the respondent expresses reasoning consistent with market efficiency and standard risk-based asset pricing or reasoning consistent with a neglect of equilibrium price adjustments. We omit the codes indicating temporary mispricing, as such reasoning rarely occurs in most of our samples. The omitted base category otherwise mostly includes responses that were not assigned to any category. Across all our samples, respondents whose explanation neglects equilibrium price adjustments are significantly (between 31pp and 60pp) more likely to make news-congruent forecasts (Appendix Table B.9). Conversely, respondents whose rea-

[11] This finding aligns with recent evidence that many investors do not consider the correlation of stock returns with consumption growth in their investment decisions (Chinco et al., 2022). Our evidence suggests that – in addition to neglecting systematic risk exposure in their own investment decisions – households do not view asset prices and expected returns as primarily reflecting exposure to such risks.

[12] In additional analyses, we confirm that arguments neglecting equilibrium pricing are prevalent among households for all additional firm-specific scenarios and the aggregate stock market scenarios, where most respondents refer to expected future economic growth and company earnings (Appendix Figure A.4). Similarly, in the real news robustness study reported in Section 3, many respondents directly link expected returns to expected earnings. The text data collected in this study are harder to classify because the between-subject design does not allow us to specify a clear counterfactual scenario.

[13] Moreover, we leverage an additional structured question that presents respondents with a set of preformulated statements, largely corresponding to the codes used to categorize the open-ended responses. We place this question at the very end of the survey to avoid influencing respondents' forecasts about returns over future horizons, earnings, uncertainty, and risk-factor exposure, which are elicited after the open-ended question. However, this means that respondents have to recall the reasoning behind a forecast made several minutes earlier and that their response to the structured question is likely influenced by the various forecasts they provided in between. Nevertheless, we replicate our main finding: academic experts are much more likely to select arguments in line with efficient markets, while households and financial advisors display a much stronger tendency to cite changes in corporate earnings as a driver of expected returns (Appendix Table B.11).

soning aligns with efficient markets or risk-factor-based asset pricing are significantly (between 34pp and 60pp) less likely to make such forecasts. The differences in reasoning can almost entirely account for the differences in the return forecasts between academic experts and our other samples: these differences are strongly reduced in size and statistical significance once we control for reasoning. The difference only remains significant for retail investors, but even here it drops to about 15% of its original size (Appendix Table B.10).

4.2 The co-movement of expectations

Our second approach to studying respondents' mental models explores which models are "revealed" by the co-movement of respondents' expectations about different variables. While this strategy is purely correlational, it does not require our respondents to be able to articulate their reasoning. It thus provides a complementary approach to assessing the potential of different mental models to account for respondents' forecasts.

Data In our survey, respondents not only forecast future returns, but they also predict in which scenario market participants expect (i) future earnings, (ii) the uncertainty of the stock return, and (iii) the stock's "exposure to circumstances that investors deem unfavorable" – i.e., to systematic risks – to be higher. Respondents subscribing to the notion of market efficiency and risk-based asset pricing should predict returns to co-move with uncertainty and risk-factor exposure. Respondents neglecting endogenous price adjustments should predict returns to co-move with the future earnings that can be expected for the company.

For US households and financial advisors, we can also draw on quantitative twelve-month first- and second-order return beliefs in the two scenarios to shed light on beliefs in mispricing (Appendix Figure A.1). Specifically, respondents could be overconfident in their own belief about what a specific piece of public news implies for a company's future earnings – a key source of disagreement in return expectations in an influential class of asset pricing models (e.g., Scheinkman and Xiong, 2003). For instance, they might expect other market participants to be overly optimistic about the increase in future company earnings implied by positive earnings news. In the eyes of such a respondent, market participants' buying behavior would have driven the stock price to an over-valued level. If the respondent attaches some probability to a market correction, they would decrease their first-order expectation about the future return relative to their second-order expectation when going from the neutral to the good news scenario. The reverse logic applies to respondents who believe that other market participants are too pessimistic about the increase in future company earnings implied by the news. Thus, relative differences in second- versus first-order return expectations across scenarios are

Table 2 Correlations between directional return expectations and other expectations

	Dummy for news-congruent expected returns (Good news ⇒ higher exp. return *or* bad news ⇒ lower exp. return)						
	Academic experts	Fund managers	Financial advisors	US retail investors	GER retail investors	US general population	GER general population
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Exp. earnings aligned	0.086	0.307***	0.425***	0.388***	0.225***	0.416***	0.526***
	(0.066)	(0.106)	(0.046)	(0.057)	(0.081)	(0.036)	(0.025)
Exp. uncertainty aligned	0.233**	0.018	0.143***	0.053	0.010	0.075**	0.074**
	(0.096)	(0.102)	(0.041)	(0.038)	(0.054)	(0.033)	(0.029)
Exp. risk factor aligned	0.437***	0.198*	−0.081*	0.073*	0.037	−0.012	0.014
	(0.166)	(0.103)	(0.044)	(0.038)	(0.053)	(0.035)	(0.028)
Others overreacting (where data available)			−0.093*	−0.007		−0.028	
			(0.051)	(0.050)		(0.039)	
Others underreacting (where data available)			0.034	0.143***		0.039	
			(0.046)	(0.043)		(0.038)	
Constant	0.007	0.205**	0.416***	0.388***	0.539***	0.415***	0.225***
	(0.048)	(0.091)	(0.052)	(0.060)	(0.082)	(0.036)	(0.019)
Observations	102	96	406	408	299	672	1,288
R^2	0.196	0.123	0.280	0.194	0.033	0.211	0.283

Notes: This table regresses respondents' directional return forecasts on their forecasts about other variables, pooling across the *Nike good news* and the *Nike bad news* survey arms. The outcome is a dummy variable for expecting the stock return over the next 12 months to be higher (lower) in the good news (bad news) scenario. The independent variables are dummy variables indicating whether a respondent believes that market participants expect earnings, the uncertainty of the return, or the exposure of the return to systematic risk to be higher (lower) in the good news (bad news) scenario. The dummy variable "Others overreacting" takes value one if the respondent increases (decreases) their quantitative second-order return expectation by 0.5pp more than their first-order return expectation after stale good (bad) news. The dummy variable "Others underreacting" takes value one in the reverse case where respondents decrease (increase) their quantitative second-order expectation by 0.5pp more than their first-order expectation. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

proxies for beliefs in particular forms of mispricing.

Results We study the co-movement of expectations by regressing an indicator for news-congruent forecasts (higher returns for stale good news, lower returns for stale bad news) on dummy variables indicating whether a respondent predicts market expectations about earnings, uncertainty of the return, or exposure to systematic risk to be higher (lower) in response to stale good news (bad news). We also include dummy variables indicating beliefs in overreaction or underreaction of other market participants constructed from the quantitative first- and second-order return expectations.

Table 2, Column 1, presents the results for academic experts. Among them, the perceived earnings expectations of the market are not significantly related to return forecasts. Instead, experts' return forecasts are significantly positively correlated with expected uncertainty ($p = 0.017$) and even more strongly with expected exposure to systematic risk ($p = 0.010$).

By contrast, among financial advisors and households, the perceived earnings expectations of the market seem to be the most central variable in return forecasts (Columns 3–7). For instance, when a US retail investor thinks the market expects company earnings to be higher, the likelihood that the respondent also predicts the return to be higher increases by 39 percentage points ($p < 0.001$). While the expected uncertainty of the return is correlated with return expectations in the conventional direction (sometimes significantly so), its role is quantitatively much smaller than the role of expected earnings. The coefficient estimates for risk factor exposure are also small and, in two out of the five cases, negative – contrary to standard asset pricing logic. Similarly, while our proxies for beliefs in temporary mispricing correlate with return expectations in the expected directions, the effects are significant in only two out of six cases and economically small. Hence, the predictive power of risk expectations and beliefs in temporary mispricing pales in comparison to earnings expectations.[14]

Among fund managers, both earnings expectations and expected risk factor exposure are positively related to return forecasts ($p = 0.005$ and $p = 0.057$, respectively, Column 2), consistent with a prevalence of both types of mental models in this sample.

Taken together, the results confirm the conclusions from the qualitative text data: households' and financial advisors' return forecasts closely co-move with expected company earnings, whereas academic experts' forecasts are most closely related to the expected exposure to systematic risk, in line with standard risk-based asset pricing logic. Fund managers exhibit characteristics of both groups, consistent with the heterogeneous views detected in their text data.

4.3 Experiments with households: Ruling out risk-based reasoning and beliefs in mispricing

Our third approach zooms in on the mental models of general population respondents. We design experimental interventions to detect previously unobserved traces of reasoning in line with risk-based asset pricing or temporary mispricing. Arguably, the previous evidence already strongly suggests that neither of the two views plays an important role in households' reasoning. However, one might worry that respondents find it challeng-

[14]Appendix Table B.12 shows that the patterns for US households and financial advisors are robust to focusing on good and bad news separately and to extending the analysis to all five return horizons, with or without the inclusion of respondent fixed effects. Thus, earnings expectations predict return expectations across different future periods even *within-respondent*. This suggests that the increasing share of neutral return predictions for later horizons (Appendix Figure A.2) is not due to a belief in delayed market efficiency but instead simply reflects respondents' belief that the news' relevance for future earnings fades over time. These patterns are similar for German retail investors, which are omitted to preserve space. Appendix Table B.12 also highlights that the return forecasts general population respondents provide in the macroeconomic scenarios are strongly positively correlated with their forecasts about aggregate firm earnings and only weakly related to forecasts about other variables.

ing to articulate reasoning in line with risk-based pricing or temporary mispricing or that their predicted co-movement of expected returns with other variables is confounded by measurement error or omitted variables. To address these concerns, our additional interventions explicitly rule out changes in risk exposure or temporary mispricing. If either of these two mechanisms were important for respondents' return forecasts, we should see strong shifts in their forecasts in response to our interventions.

Sample We run the experiment with Prolific in June 2023. 1,182 US households participate.[15]

Design Our experiment focuses on the *Nike good news* scenario. Participants are randomized into one of three conditions. In the control group, respondents simply complete a shortened version of our main survey. The *No changes in risk exposure* condition contains an additional, saliently placed message on the survey screen on which respondents make their return forecast. The message explicitly rules out changes in volatility and exposure to systematic risk:

> **[No changes in risk exposure]** Please assume that there are no differences in the investment-relevant uncertainty between the two scenarios. In particular, this means
>
> - identical volatility: while deviations from the best forecast for the future return of Nike stock are possible, the possible deviations are equally sizable and equally likely in both scenarios,
> - identical protection against general developments that are deemed unfavorable by investors: in both scenarios, an investment in Nike stock provides the same degree of protection against general developments that are deemed unfavorable by investors, such as the risk that the economy as a whole performs poorly.

Respondents in the *No temporary mispricing* condition are instead presented with a message that rules out temporary mispricing:

> **[No temporary mispricing]** Please assume that the stock price of Nike has changed over the last four weeks since the announcements. The stock price responded to what the announcements revealed about Nike's future business prospects. Please assume that the current stock price fully and correctly reflects Nike's future business prospects in both scenarios.

If predictions of higher returns following stale positive earnings news are driven by perceived changes in risk exposure or beliefs in temporary over- or underreaction of stock prices, we should observe strong shifts in households' return forecasts in response to these treatments.

[15] The sample is balanced across the three experimental conditions (see Appendix Table B.5). Appendix Table B.4 provides summary statistics. The survey instructions are in Appendix E.3.

Table 3 Ruling out risk-based reasoning and beliefs in mispricing

	Dummy for predictions: **Good news** ⇒ ...			**Reasoning**	
	Return higher	Return similar	Return lower	Neglect of eq. pricing	Efficiency
	(1)	(2)	(3)	(4)	(5)
Ruling out risk	−0.041	0.027	0.014	−0.004	−0.012
	(0.032)	(0.028)	(0.020)	(0.033)	(0.011)
Ruling out mispricing	0.027	−0.025	−0.002	0.039	−0.007
	(0.031)	(0.026)	(0.019)	(0.032)	(0.011)
Constant	0.741***	0.177***	0.082***	0.693***	0.030***
	(0.022)	(0.019)	(0.014)	(0.023)	(0.009)
Observations	1,182	1,182	1,182	1,182	1,182
R^2	0.004	0.003	0.001	0.002	0.001

Notes: This table analyzes treatment effects of interventions that rule out risk-based reasoning and beliefs in mispricing. The experiment is based on the *Nike good news* scenario. The outcome is a dummy variable for expecting the stock return over the next 12 months to be higher in the good news than in the neutral scenario (Column 1), to be similar across the two scenarios (Column 2), or to be lower in the good scenario (Column 3), or a dummy variable for expressing reasoning in line with a neglect of equilibrium price adjustments – pooling the codes on changes in earnings and investors' reactions – (Column 4) or with market efficiency – pooling the codes on information efficiency, changes in uncertainty, and changes in factor exposure – (Column 5) in the open-ended question. The independent variables are dummy variables indicating whether a respondent is part of a specific treatment arm, where the control group is the omitted base category. The underlying sample consists of US general population respondents. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Results Columns 1–3 in Table 3 regress dummy variables for predicting a higher return in the good news scenario, similar returns in both scenarios, or a lower return in the good news scenario on indicators for the two treatment conditions. Compared to the control group, the *No changes in risk exposure* intervention only marginally reduces the portion of respondents forecasting higher returns from 74% to 70% ($p = 0.200$). The *No temporary mispricing* intervention leads to a small, insignificant increase in the fraction of respondents expecting higher returns ($p = 0.372$). These patterns underscore that households' inclination to equate future earnings with future stock returns does not result from standard asset-pricing reasoning or beliefs in temporary mispricing. Columns 4 and 5 of Table 3 highlight that the interventions also do not change respondents' tendency to invoke arguments consistent with market efficiency or the neglect of equilibrium price adjustments when they explain their forecast in the open-ended question, consistent with the muted effects on return forecasts.

Extensions We conduct an additional variant of our experiment, which contains two modified treatment arms and a control group (Prolific, 906 US households, August 2024). First, our original *No temporary mispricing* condition makes it clear that the current stock price correctly reflects Nike's future business prospects. However, one potential concern is that households still believe that mispricing is relevant, but only in the future. For instance, respondents might believe in delayed over-reaction of stock prices driven by return chasing among other investors. Hence, the first treatment in our addi-

tional experiment extends the *No temporary mispricing* condition by asking participants also to assume that the "future stock prices of Nike in both scenarios fully and correctly reflect whatever will be known about Nike's business prospects in the future." Second, most theories of mispricing imply that expected and, thus, redundant news does not trigger a mispriced market response. The second treatment in our additional survey thus highlights to respondents that "[i]ndustry experts and stock market traders were not surprised [by the news] because they had known about the continuation/change of the partnership for a long time". As can be seen in Appendix Table B.13, neither intervention reduces the fraction of news-congruent return forecasts or changes respondents' reasoning. This provides further evidence that inference from stale news is not due to beliefs in temporary mispricing.

Conclusion Taken together, our second main result can be summarized as follows:

> **Result 2.** Mental models are heterogeneous across investor groups but also within the important group of fund managers. General population, retail investors, financial advisors, and even a fraction of fund managers neglect the offsetting effects of equilibrium price adjustments when forming stock return expectations. By contrast, academic experts' forecasts are mostly based on a belief in market efficiency.

5 Origins of the neglect of equilibrium pricing

A neglect of equilibrium pricing is prevalent in our samples of households and financial advisors. This section explores where this feature of agents' mental models of the stock market comes from. We focus on households from the US.

To fix ideas, recall that the expected (gross) return is defined as $E_t(R_{t+1}) = E_t(P_{t+1} + D_{t+1})/P_t$. In contrast to the neutral news scenario, two things happen in the good news scenario. In the numerator, the stale positive earnings news increases the sum of the expected future dividend and the resell value by some factor ϕ_D. In the denominator, it increases the current stock price by some factor ϕ_{P_t}. Neglecting equilibrium pricing means directly inferring an increase in expected future returns from the increase in expected future dividends ϕ_D without any reference to risk or mispricing and, hence, neglecting the equilibrium price adjustment ϕ_{P_t}. This neglect of equilibrium pricing could result from (a combination of) three sources.

1. **Inattention to past price changes.** Households are inattentive to past price changes ϕ_{P_t}.
2. **Not applying the return formula.** Households do not reason through the correct return formula $E_t(R_{t+1}) = E_t(P_{t+1} + D_{t+1})/P_t$ when they form their expectations. They do not understand how ϕ_{P_t} matters for future returns.

3. **Misunderstanding equilibrium pricing.** Households do not understand that, absent risk differences or mispricing, the price change precisely offsets the change in future expected dividends: $\phi_D = \phi_{P_t}$.

We test these ideas in a series of additional experiments.[16]

5.1 Inattention to past price changes

Since the news in the two scenarios is described as four-weeks old, other traders have had plenty of time to react to the news and buy or sell the stock, leading to a change in the stock price. However, inattention to such indirect, contingent, and downstream consequences is a common behavioral phenomenon (Bordalo et al., 2022b; Dal Bó et al., 2018; Eyster, 2019; Gabaix, 2019; Greenwood and Hanson, 2015; Niederle and Vespa, 2023). Do households simply fail to pay attention to the trading responses and price changes that would have happened over the past four weeks? To explore this possibility, we design an experiment that channels households' attention towards these trading and price responses.

Sample We run the experiment with Prolific in June 2023. 1,183 US households participate.[17]

Design Our design is based on the *Nike good news* scenario. Participants are randomly assigned to one of three conditions. Participants in the control group complete a shortened version of our standard survey. Participants in the *Attention to trading reactions* condition respond to one additional question. Just before they make their return forecast, they are asked how other traders reacted to the announcement in the scenarios over the past four weeks (others were more eager to hold the stock, no change, less eager to hold the stock). Participants in the *Attention to price reaction* condition respond to the same question and are additionally asked how other traders' reactions affected Nike's stock price over the past four weeks (it increased, did not affect, or decreased the price). Immediately afterward, respondents in these two arms proceed with their return forecast.

The two interventions are unobtrusive and seamlessly fit into the survey flow. Yet, at the same time, they effectively draw respondents' attention to trading reactions and

[16] We also consider and rule out a simple form of affective reasoning that leads households to associate *any* news with a positive valence with good returns (see Appendix C.1). In a complementary survey with manifestly bad affective news (death of a beloved ex-employee) and good news (joint celebration of ex-employees' birthday), 78% of households do *not* expect a return difference across scenarios. Households explain their neutral forecast by arguing that the scenarios do not matter for Nike's future business prospects. Thus, respondents do not blindly associate "good" news with higher returns; they have an economic channel in mind whereby expected earnings matter for future returns.

[17] Our sample is balanced across conditions (Appendix Table B.5). Summary statistics are shown in Appendix Table B.4. The experimental instructions are in Appendix E.4.

ensuing price changes and ensure that respondents think about them just before forecasting the return. In fact, 88% of respondents who receive the question on trading reactions predict a higher eagerness of other traders to buy the stock at the old stock price. Similarly, 88% of respondents who receive the question on price changes predict that the price has increased in response to other traders' reactions.

Results If inattention is indeed contributing to the observed neglect of equilibrium pricing among households, we would expect that these interventions reduce the proportion of respondents predicting higher stock returns in the good news scenario. However, as shown in Panel A of Table 4, neither intervention significantly alters respondents' tendency to expect that stock returns over the next 12 months are higher in the stale good news scenario, nor does it reduce the fraction who reveal a neglect of equilibrium pricing in the open-ended elicitation.

Extension: Quantitative return forecasts When households are made attentive to past price changes they continue to predict higher returns after stale good news. Could attention to past price changes have a more subtle effect and only lead to a smaller expected *quantitative* return difference between the good news and the neutral scenario? We test this in an analogous attention experiment that elicits quantitative return expectations for both scenarios (Prolific, $n = 603$, August 2024). We replicate the small and insignificant effect of the attention intervention (see Appendix Table B.14).

Conclusion Drawing respondents' attention to the trading and price reactions since the announcement does not change their tendency to equate higher expected earnings with higher expected returns. Inattention to trading and price reactions therefore does not seem to be the primary driver of households' neglect of equilibrium pricing.

5.2 Not applying the return formula

Knowing that the stock became more popular and its price rose over the past four weeks can affect return forecasts only if households understand how these price changes matter for future returns. However, households may struggle to apply the correct return formula. To explore this possibility, we design an experiment that carefully explains the return formula to participants and walks them through its application.

Sample We run the experiment with Prolific in August 2024. 1,034 US households participate.[18]

[18]Our sample is broadly balanced across conditions, with the exception of the share of stockowners (Appendix Table B.5). In unreported analyses, we confirm that controlling for background characteristics leaves the results virtually unchanged. Summary statistics are shown in Appendix B.4. The experimental instructions are in Appendix E.5.

Table 4 Experimental results on the origins of the neglect of equilibrium pricing

Panel A: *Attention* experiment

	Dummy for predictions: **Good news ⇒ ...**			**Reasoning**	
	Return higher	Return similar	Return lower	Neglect of eq. pricing	Efficiency
	(1)	(2)	(3)	(4)	(5)
Traders' reaction	0.016	−0.023	0.006	0.038	0.010
	(0.031)	(0.027)	(0.019)	(0.033)	(0.009)
Traders' reaction & prices	0.003	−0.011	0.007	0.016	0.008
	(0.031)	(0.028)	(0.019)	(0.034)	(0.009)
Constant	0.732***	0.192***	0.076***	0.657***	0.013**
	(0.022)	(0.020)	(0.013)	(0.024)	(0.006)
Observations	1,183	1,183	1,183	1,183	1,183
R^2	0.000	0.001	0.000	0.001	0.001

Panel B: *Explain return formula* experiment

	Return higher	Return similar	Return lower	Neglect of eq. pricing	Efficiency
	(1)	(2)	(3)	(4)	(5)
Assist w/ return formula	−0.037	0.043*	−0.006	−0.058**	0.030**
	(0.026)	(0.022)	(0.017)	(0.027)	(0.014)
Constant	0.784***	0.129***	0.087***	0.782***	0.034***
	(0.018)	(0.014)	(0.012)	(0.018)	(0.008)
Observations	1,034	1,034	1,034	1,034	1,034
R^2	0.002	0.004	0.000	0.004	0.005

Panel C: *Explain equilibrium pricing* experiment (includes assistance with the return formula)

	Return higher	Return similar	Return lower	Neglect of eq. pricing	Efficiency
	(1)	(2)	(3)	(4)	(5)
Explain equilibrium	−0.174***	0.152***	0.022	−0.134***	0.103***
	(0.030)	(0.027)	(0.019)	(0.029)	(0.018)
Constant	0.772***	0.146***	0.082***	0.778***	0.030***
	(0.019)	(0.016)	(0.012)	(0.019)	(0.008)
t-test (H_0: Assist with return formula = Explain equilibrium)					
	$p < 0.001$	$p < 0.001$	$p = 0.213$	$p = 0.008$	$p < 0.001$
Observations	950	950	950	950	950
R^2	0.035	0.034	0.001	0.022	0.037

Notes: This regression table analyzes the treatment effects of interventions that draw respondents' attention to other market participants' trading reactions and the ensuing price changes (Panel A), explain the return formula (Panel B), or the concept of equilibrium pricing to respondents (Panel C) before they make their return forecast. The surveys are based on the *Nike good news* scenario. The outcome is a dummy variable for expecting the stock return over the next 12 months to be higher in the good news than in the neutral scenario (Column 1), to be similar across the two scenarios (Column 2), or to be lower in the good news scenario (Column 3), or a dummy variable for expressing reasoning in line with a neglect of equilibrium price adjustments (Column 4) or with market efficiency (Column 5) in the open-ended question. The independent variables are dummy variables indicating whether a respondent is part of a specific treatment arm, where the respective control group is the omitted base category. The underlying samples consist of US general population respondents. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Design The design again relies on the *Nike good news* scenario. Participants are randomly assigned to one of two conditions. Participants in the treatment condition receive a tutorial on how stock returns are calculated. The tutorial carefully explains that returns depend on the ratio of two ingredients: (i) the future stock price and dividend (which we label "stock revenue"), and (ii) the current stock price. We explain to the respondents that returns are higher (unaffected / lower) when the expected future stock price and dividend increase by more (the same amount / less) than the current stock price. Participants are asked to summarize the tutorial in their own words. Control group participants receive a tutorial on an unrelated topic of similar length and difficulty (population growth).

To make applying the return formula as easy as possible, we provide further assistance to treated respondents. After participants have read the scenarios, they are first asked to predict in which scenario the future stock price and dividend will be higher (ingredient (i)). Next, we ask them in which scenario the current stock price is higher (ingredient (ii)). Afterward, we remind them that returns depend on the ratio of both quantities. Only then, we ask in which scenario the respondents would expect a higher return.

Results Do return forecasts differ if we carefully explain and walk participants through applying the return formula? Panel B of Table 4 shows that the intervention has, at most, modest effects. It reduces the share of news-congruent forecasts by 4pp without reaching statistical significance (p=0.167). The share of explanations that link expected returns with expected earnings decreases by a statistically significant but economically modest 6pp (p=0.033).

Conclusion Educating households on how to apply the return formula does not significantly affect their return expectations. The central gap in households' reasoning must lie elsewhere.

5.3 Misunderstanding equilibrium pricing

Even if households pay attention to past price changes and are assisted in using the correct return formula, they continue to infer higher future returns from stale good news about future dividends. This pattern suggests that households do not understand that past price changes are related to the higher expected future dividends in a very specific way: in equilibrium and absent mispricing, prices adjust until no arbitrage is possible, which means that prices adjust until they precisely offset the higher expected future earnings. No further surplus return can be expected afterward. Thus, households' mental model has a gap: it does not feature equilibrium pricing. They acknowledge past price changes, but do not understand their meaning.

To study this possibility, we conduct an experimental intervention aimed at closing

the gap in respondents' mental model by explaining to respondents how future expected earnings are incorporated into prices in financial markets.

Sample We run the experiment with Prolific in August 2024, in parallel to the return formula experiment. 950 US households participate, and we randomize participants across experiments to allow for comparisons between the two experiments.[19]

Design Once more, we use the *Nike good news* scenario. Participants are randomized into one of two conditions. As before, the treatment condition explains and walks participants through applying the return formula, but it extends the tutorial in one crucial aspect: participants also receive a comprehensive explanation of how and why earnings expectations are incorporated into stock prices. This explanation emphasizes that stocks of companies with lower future earnings must be priced lower to attract investors, while companies with higher future earnings must be priced higher. It further explains how, if this were not the case, stock prices would adjust due to arbitrage. The explanation concludes that, "if stock prices accurately reflect what is known about the future, the expected future success of a company does not matter for the expected future return of an investment in the company's stock. You get what you pay for, and you pay for what you get."[20] Respondents are then asked to summarize this principle in their own words. In the control condition, participants instead receive an explanation about an unrelated topic of similar length and difficulty (how population growth relates to the resource richness of the environment).

Results If inference from stale news originates from a failure to understand equilibrium pricing, our intervention – aimed at filling this mental gap – should reduce the proportion of respondents predicting higher returns in response to stale good news. Indeed, Column 1 of Table 4, Panel C, illustrates that the intervention strongly reduces the proportion of respondents forecasting higher returns in the *Nike good news* scenario from 77% to 60% ($p < 0.001$). This 17pp effect far exceeds the effect of explaining the return formula in Section 5.2 ($p < 0.001$). The effect is mirrored by an increase in the fraction of participants forecasting similar returns across the two scenarios from 15% to 30% ($p < 0.001$, Column 2). The fraction predicting lower returns in the good news scenario is unaffected by the intervention (Column 3). Columns 4 and 5 of Panel B highlight that these forecasts are accompanied by a 10.3pp-increase in the tendency to invoke market efficiency when explaining the reasoning underlying the return forecast

[19] Our sample is balanced across conditions (Appendix Table B.5). Summary statistics are shown in Appendix B.4. The experimental instructions are in Appendix E.6.

[20] The conditional nature of this statement is important. We explicitly inform respondents that, if stock prices *incorrectly* reflect expected future dividends and prices, future returns can deviate from this benchmark. Moreover, respondents learn that riskier stocks commonly have higher returns. Thus, we address the misunderstanding that future dividends matter for future returns in the absence of mispricing but still give respondents the room to interpret the stale news scenarios in various ways.

($p < 0.001$). Conversely, reasoning revealing a neglect of equilibrium pricing is reduced by 13.4pp among treated respondents ($p < 0.001$).

Is the 17 percentage points reduction in news-congruent forecasts a large effect? We think that the answer is yes. Equilibrium reasoning is difficult to grasp, and our (for the median-respondent) 12-minutes-long intervention is not a silver bullet. For example, we observe that participants who continue to make news-congruent forecasts still commonly explain these forecasts by equating expected returns with expected earnings. Larger effects would probably require more intense training.

Extension: Two-wave design Since we integrate the explanation of equilibrium pricing and our outcome measure — the return forecast — in the same survey, experimenter demand effects are a potential concern. For this reason, we conducted an additional two-wave experiment in June 2023 (Prolific, $n = 947$ in wave 1, $n = 588$ in wave 2). Wave 1 of the study mirrors the structure of the above experiment, although the precise instructions differ slightly. Treated participants learn why expected earnings do not matter for future returns, while participants in the control group learn about a neutral topic (the tides and what determines the tidal range). We find virtually identical results. Importantly, we also recontact participants and invite them to a follow-up survey one to three days later, in which demand effects should be mitigated (de Quidt et al., 2018). Participants face a different scenario (the *Amazon good news* case) and provide an additional forecast and explanation. Reassuringly, the reduced tendency to make news-congruent return forecasts persists in the follow-up survey (see Appendix B.15).

Extension: Knowledge transfer In addition, we conduct three "transfer" experiments in which we test whether households can apply their newly acquired knowledge of equilibrium pricing in other contexts (total $n = 4{,}807$, see Appendix C.2). We replicate that informing households about equilibrium pricing reduces the tendency to make news-congruent return forecasts – on average by 19pp, even slightly more than in our main experiment. In a second wave, we test whether households can apply this knowledge in other contexts. In an IV specification, we find that it reduces respondents' tendency to think that one needs to spend "a lot of time" monitoring business news to successfully invest in the stock market – a crucial facet of participation costs (Duraj et al., 2024). We also cross-randomize whether respondents receive stale positive or negative real-world news about a company and find that those who acquired equilibrium knowledge because of our intervention predict similar returns and invest similar amounts in response to good and bad news. By contrast, respondents without this knowledge forecast significantly higher returns and invest significantly more following stale good news than following bad news. We lack the statistical power to precisely estimate differences in the responses between those with and those without equilibrium knowledge.

Conclusion Taken together, when households are made familiar with the concept of equilibrium pricing, a substantial fraction start reasoning and forecasting returns in line with market efficiency. This effect also illustrates the complementary nature of attention and mental models. If the model is misspecified and does not attribute an important role to the market response, increasing attention to the market response is futile. Instead, a correction of the mental model is required.

Our third main result is the following:

Result 3. Drawing attention to trading and price responses over the past month does not significantly influence households' return forecasts, nor does explaining the correct return formula. Instead, households' forecasts respond to an intervention that explains that past price changes and changes in expected dividends are tightly linked. Thus, the neglect of equilibrium pricing originates from a gap in households' mental models: they do not understand the concept of equilibrium pricing in financial markets.

6 Equilibrium pricing neglect and expectation anomalies

The evidence we presented so far suggests that the general population, retail investors, and many financial professionals neglect equilibrium pricing when thinking about returns on financial markets. This fundamental gap in investors' mental models matters because it likely shapes their return expectations and investment behavior in the real world. In this section, we use panel data on households' actual stock market expectations to test whether a neglect of equilibrium pricing is predictive of two well-known "anomalies" in agents' real-world expectation formation.

First, households' return expectations tend to co-move positively with expectations about overall economic growth (Beutel and Weber, 2024; Giglio et al., 2021a) and are highest during economic booms and lowest during recessions (Amromin and Sharpe, 2013). This "pro-cyclicality" is contrary to standard asset pricing logic, which would suggest that expected returns are highest during recessions – when economic agents require the highest compensation for bearing risk. However, a mental model neglecting equilibrium pricing naturally produces pro-cyclical expectations: expected earnings are higher in booms, hence "equilibrium pricing neglectors" also expect higher future returns.

Second, many agents appear to extrapolate past stock returns (Greenwood and Shleifer, 2014; Vissing-Jorgensen, 2003). A neglect of equilibrium pricing could contribute to this pattern: high past returns often reflect positive news about future earnings, which makes equilibrium pricing neglectors also more optimistic about future

stock returns, thereby producing a positive co-movement of expectations about future returns with past realized returns.

Data Our general population survey in Germany was conducted as part of the June 2023 wave of the Bundesbank Online Panel – an established survey on household expectations (Beckmann and Schmidt, 2020). Respondents repeatedly participate in the monthly surveys, rotating into and out of the panel following an involved scheme. Our dataset is an unbalanced monthly panel from January 2021 until January 2024 with a total of 30,463 observations, which belong to the 3,852 households that participated in our survey module in June 2023. In all waves, the survey elicits respondents' expectations about the return of the German stock market and overall economic growth over the next 12 months. These expectations are elicited on a 5-point categorical scale. We take this scale as cardinal and z-score it using the mean and standard deviation in our panel data. The exact wording of the survey questions is presented in Appendix E.7.

Empirical specification We estimate the following two specifications to test whether pro-cyclicality and return extrapolation are more pronounced among equilibrium pricing (EP) neglectors:

$$\text{(1)} \qquad \mathbb{E}_{i,t}\mathrm{r}_{t,t+12} = \alpha_1 \mathbb{E}_{i,t}\mathrm{g}_{t,t+12} \times \text{EP neglect}_i + \alpha_2 \mathbb{E}_{i,t}\mathrm{g}_{t,t+12} + \mu_i + \varepsilon_{i,t}$$

$$\text{(2)} \qquad \mathbb{E}_{i,t}\mathrm{r}_{t,t+12} = \alpha_1 \mathrm{r}_{t-12,t} \times \text{EP neglect}_i + \alpha_2 \mathrm{r}_{t-12,t} + \mu_i + \varepsilon_{i,t} \quad ,$$

where $\mathbb{E}_{i,t}\mathrm{r}_{t,t+12}$ is respondent i's subjective return expectation for the next 12 months, $\mathbb{E}_{i,t}\mathrm{g}_{t,t+12}$ is respondent i's expectation about economic growth over the next 12 months, and $\mathrm{r}_{t-12,t}$ is the realized return of the German stock market over the 12 months prior to the survey day (which does not vary across respondents interviewed on a given day). The dummy variable "EP neglect$_i$" takes value one for participants who infer high future returns from stale good news (or low returns from stale bad news) in our main survey module included in June 2023. We use the label "EP neglect$_i$" as making news-congruent return forecasts largely reflects the neglect of equilibrium pricing (see Section 4). μ_i are individual fixed effects, which capture permanent differences in return expectations across investors, and $\varepsilon_{i,t}$ is the error term. Alternative specifications additionally control for survey day t fixed effects. We cluster standard errors at the respondent level. Our main object of interest is α_1, which captures how respondents who neglect equilibrium pricing differentially adjust their return expectations when they increase their expectations about economic growth or when the past realized return increases.

Results Table 5 displays the results. As shown in Columns 1 and 2, respondents' expectations about stock returns co-move positively with their growth expectations. Importantly, this "pro-cyclicality" is significantly stronger among equilibrium pricing neglectors ($p = 0.002$). Controlling for date fixed effects (Column 2), a one standard

Table 5 Equilibrium pricing neglect predicts pro-cyclical, extrapolative expectations

	Expected future return (DAX, 12m, std.)			
	Pro-cyclicality		Extrapolation	
	(1)	(2)	(3)	(4)
Expected growth × EP neglect	0.046***	0.039***		
	(0.015)	(0.015)		
Expected growth	0.275***	0.206***		
	(0.012)	(0.012)		
Past return/100 × EP neglect			0.213***	0.255***
			(0.079)	(0.078)
Past return/100			1.275***	
			(0.060)	
Respondent FE	✓	✓	✓	✓
Date FE	–	✓	–	✓
Observations	30,463	30,463	30,463	30,463
R^2	0.470	0.521	0.460	0.498

Notes: This regression table analyzes the predictiveness of equilibrium pricing neglect for the tendencies to form pro-cyclical or extrapolative stock market return expectations. We use panel data from January 2021 until January 2024 on respondents to our German general population survey, which was included in the June 2023 wave of the Bundesbank Online Panel Households (BOP-HH). Columns 1–2 present estimates of equation 1, regressing respondent i's subjective stock market return expectation for the next 12 months (5-point categorical scale, standardized) on the respondent's expected growth for the next 12 months (5-point categorical scale, standardized), interacted with a dummy indicating whether the respondent exhibits a neglect of equilibrium pricing according to their prediction in our survey module (making a news-congruent return prediction). Columns 3–4 present estimates of equation 2, regressing respondent i's subjective stock market return expectation on the realized %-return of the stock market over the past 12 months (divided by 100 for readability), interacted with the proxy for equilibrium pricing neglect. Each household participates at most once in a given survey month, but the realized return and the date fixed effects are calculated on a daily basis. Standard errors clustered at the respondent level are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

deviation increase in growth expectations is associated with a 0.21 standard deviations higher return expectation, which increases by 20% when a respondent exhibits a neglect of equilibrium pricing.

Column 3 shows that respondents have extrapolative return expectations. A 10pp higher return in the past twelve months comes with a 0.13 standard deviation higher return expectation. This tendency is about 17% more pronounced among equilibrium pricing neglectors ($p = 0.007$). The size of the effects of the interaction terms is large given the likely measurement error in our proxy for equilibrium pricing neglect.

We conclude that the neglect of equilibrium pricing predicts two well-known and important anomalies in return expectations, suggesting a new microfoundation for these phenomena. In Appendix Table B.16, we demonstrate the robustness of these findings to a different coding of expectations, to focusing on past returns over different horizons, and to using alternative proxies for the neglect of equilibrium pricing. Our fourth and final main result is the following:

Result 4. A neglect of equilibrium pricing predicts households' tendency to form pro-cyclical and extrapolative stock return expectations. It could thus contribute to well-known anomalies in economic agents' real-world stock market expectations.

7 Conclusion

Financial markets are governed by return expectations. In this paper, we develop a tailored empirical approach to shed light on the mental models that underlie agents' return expectations. We combine rich expectation data with qualitative text measures of reasoning from seven different groups of economic agents represented by more than 18,000 respondents.

We document a widespread tendency among households from the general population, retail investors, and financial professionals to draw inferences from stale earnings-relevant news to a company's prospective stock return – a tendency that is absent among academic experts. This striking difference in their return forecasts results from differences in agents' understanding of financial markets. Academic experts' reasoning aligns with standard asset pricing logic and a belief in efficient markets. By contrast, households and many financial professionals employ a model that directly associates higher future earnings with higher future returns, neglecting the offsetting effect of endogenous price adjustments. Among households, this neglect of equilibrium pricing stems from a lack of familiarity with the concept of equilibrium rather than inattention to trading or price responses.

The neglect of equilibrium pricing provides a new perspective on many previously documented anomalies in return expectations and trading decisions. We show that the neglect of equilibrium pricing predicts households' tendency to form pro-cyclical and extrapolative return expectations. Indeed, it seems intuitive to infer high future returns from high economic growth or high past returns if one neglects equilibrium pricing. Both are important cues of companies' expected future performance, and hence they also appear relevant for future returns if one neglects equilibrium pricing. We also observe that households who neglect equilibrium pricing often believe that monitoring companies is central to successful stock investment. This belief could lead to mistakenly high perceived participation costs and discourage households from investing. Conditional on participating in the stock market, a neglect of equilibrium pricing could encourage over-trading, trading in response to stale news, or investment in actively managed funds.

In markets with limits to arbitrage, many of these patterns will have aggregate implications. This underscores the importance of theoretical analyses that explore the interplay of agents with heterogeneous mental models and different levels of under-

standing of equilibrium feedback (Adam and Nagel, 2023; Barberis et al., 2015, 2018; Bastianello and Fontanier, 2024b; Eyster et al., 2019; Glaeser and Nathanson, 2017). These models can generate overreaction, momentum, and return reversals, and heterogeneity in mental models provides a promising explanation for the high trading volume observed on financial markets.

The fact that so many agents fail to understand equilibrium pricing is likely relevant in other important economic contexts. It could help explain why firms sometimes underestimate competitors' investment responses and overinvest in booms (Greenwood and Hanson, 2015) or why households extrapolate future house price growth from past house price growth (Armona et al., 2019; Glaeser and Nathanson, 2017). A neglect of equilibrium pricing could also explain why households often overestimate their equilibrium impact on sustainable consumption levels (Kaufmann et al., 2024) and why investors in sustainable financial products might struggle to anticipate that the equilibrium responses of selfish agents could undo their own efforts. Market outcomes are determined in equilibrium, but these equilibria will often be shaped by agents who do not fully understand this principle.

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Appendix
Mental Models of the Stock Market

Peter Andre, Philipp Schirmer, Johannes Wohlfart

Summary of the online appendix

Section A provides additional figures.

Section B provides additional tables.

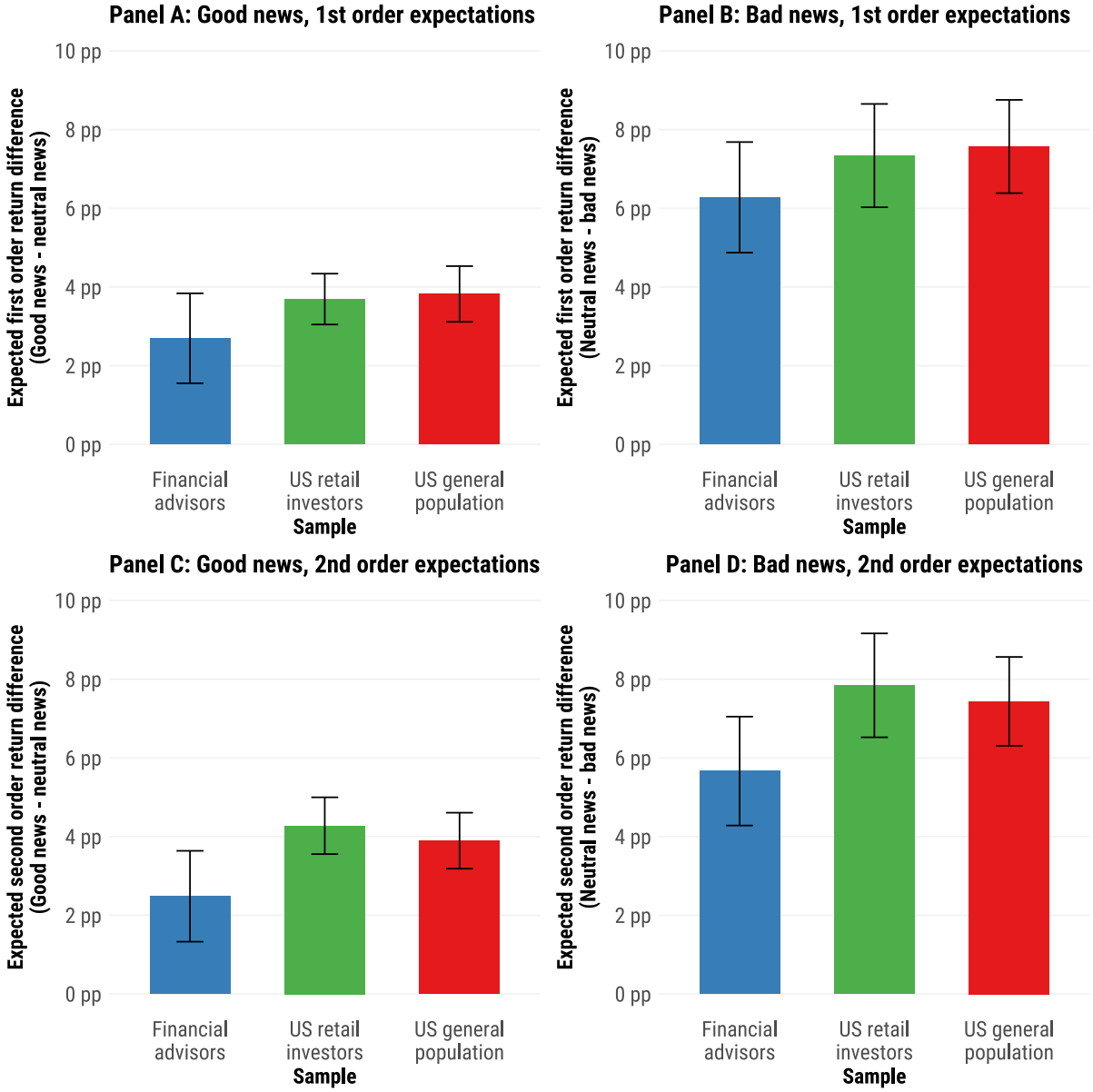
Section C presents results from additional studies.

Section D contains additional details on our empirical approach, including the academic expert survey and the hand-coding of the open-ended responses.

Section E summarizes the experimental instructions.

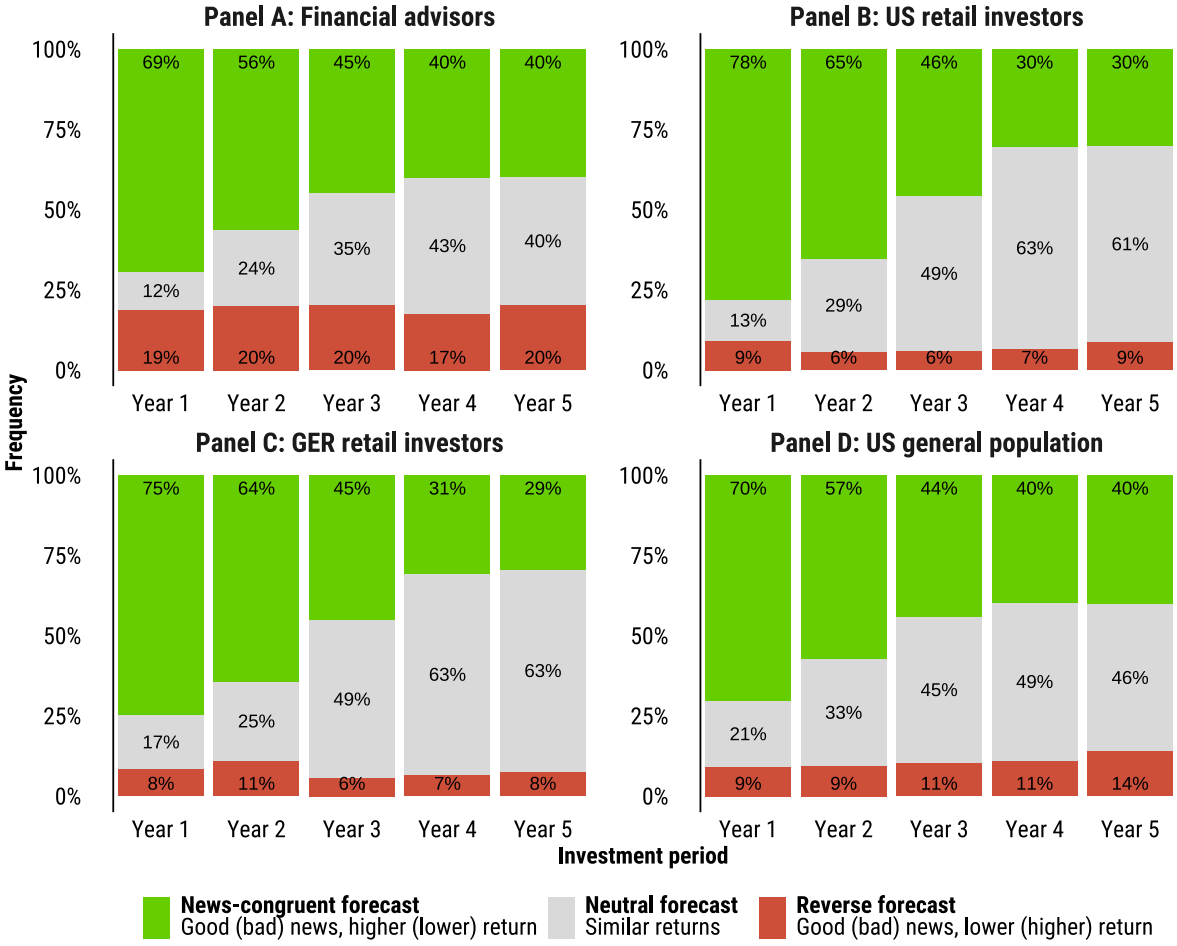
A Additional figures

Figure A.1 Quantitative return forecasts across samples: 1st- and 2nd-order



Notes: This figure shows the average predicted quantitative differences in the return over the next 12 months between the *Nike good news* and the neutral scenario (Panel A) and between the neutral and the *Nike bad news* scenario (Panel B) in our samples of financial advisors, US retail investors, and respondents from the US general population. Analogously, Panels C and D depict the average beliefs about the quantitative differences in other stock traders' return expectations across scenarios. The academic expert survey, the fund manager survey, and the German household surveys do not include quantitative first- and second-order return expectations due to space constraints. Return predictions are winsorized at ± 30 pp. Error bars indicate 95% confidence intervals.

Figure A.2 Directional return forecasts across horizons



Notes: This figure shows the distributions of directional forecasts about the difference in the expected 12-month stock return when investing now (four weeks after the announcement) or when investing in one, two, three or four years from now between the *Nike good news / Nike bad news* and the Nike neutral scenario. Forecasts are pooled across the *Nike good news* and the *Nike bad news* survey arms. The samples consist of financial advisors (Panel A), US retail investors (Panel B), German retail investors (Panel C), or respondents from the US general population (Panel D). In the survey with German retail investors, the scenarios use the fictitious company name "SportsApparel" but are otherwise identical to the "Nike" scenarios. The academic expert survey, the fund manager survey, and the German general population survey do not include forecasts for investments at future points in time due to space constraints.

Figure A.3 Word clouds

(a) Academic experts

(b) Fund managers

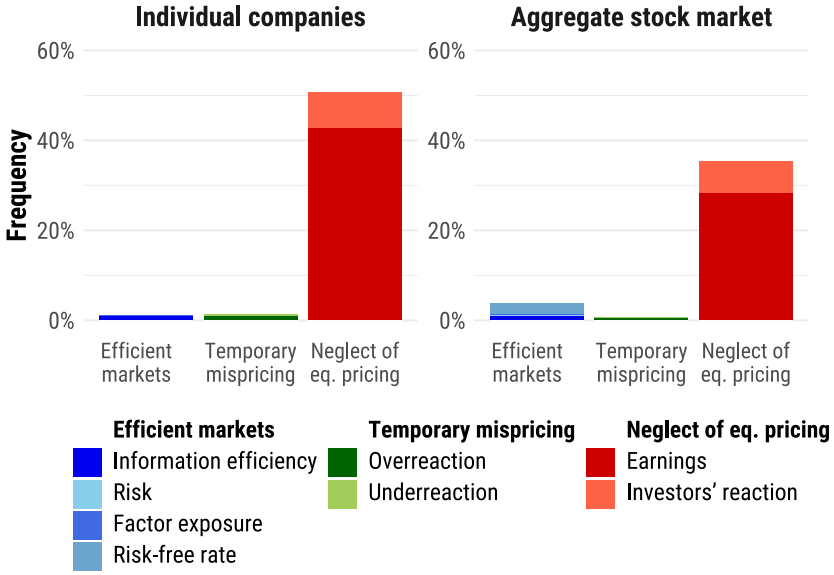
(c) Financial advisors

(d) US Retail investors

(e) US General population

Notes: The word clouds display the 30 most commonly used word stems in the qualitative text data for each sample. The word (token) size is proportional to the frequency with which it is mentioned within a sample. The text data are tokenized and stemmed, and we drop punctuation, stop words, and the commonly used words "Nike", "scenario", "stock", and "return". We focus on the surveys conducted in English for comparability.

Figure A.4 Reasoning underlying return forecasts in other scenarios



Notes: This figure displays the distributions of reasoning underlying respondents' return forecasts as expressed in the open-ended question and categorized using our coding scheme, pooling across the six individual stock scenarios and pooling across the four aggregate scenarios. The underlying sample consists of US general population respondents.

B Additional tables

Table B.1 Overview of data collections

Population	Recruitment*	n	Study content
Main descriptive study			
General population (US)	Dynata, June-July 2023, quota-targeted sampling**	2,434	Full descriptive survey. All prediction cases (six individual stocks, four aggregate cases). About 220 respondents per case, except for the two Nike cases, for which we collected 330 responses each.
Retail investors (US)	Prolific, August 2023	408	Full descriptive survey. Two cases: *Nike good news*, *Nike bad news*. Case selected randomly.
General population (Germany)	Bundesbank Online Panel (BOP-HH), June-July 2023	3,852	Streamlined, shorter version of survey (only one prediction horizon, no open-ended question on reasoning, no second-order beliefs). All six individual stock prediction cases. The scenarios are "hypothesized", i.e., we talk about fictional firms with fictional names but keep all other scenario features constant. Case selected randomly with equal chance.
Retail investors (Germany)	Online bank, November-December 2023	299	Full descriptive survey. Two cases: *Nike good news*, *Nike bad news*. These scenarios are "hypothesized", that is, we talk about the fictional firm "SportsApparel" but keep all other scenario features constant. Case selected randomly with equal chance.
Financial advisors (US)	CloudResearch, June 2023	406	Full descriptive survey. Two cases: *Nike good news*, *Nike bad news*. Case selected randomly.
Fund managers (Germany)	Two asset management firms, November 2023-March 2024	105***	Streamlined, shorter version of survey (only one prediction horizon, no second-order beliefs). Two cases: *Nike good news*, *Nike bad news*. For one of our two partnering asset management firms, the scenarios are "hypothesized", i.e., we talk about the fictional firm "SportsApparel" but keep all other scenario features constant. Case selected randomly with equal chance.
Academic experts (global)	Invited via email, June 2023	116****	Streamlined, shorter version of survey (only one prediction horizon, no second-order beliefs). Two cases: *Nike good news*, *Nike bad news*. Case selected randomly with equal chance.

*Depending on the targeted population, we rely on different recruitment strategies and survey companies.

**The sampling process targeted a sample that mirrors the general population in terms of gender, age (3 groups), region (4 groups), income (3 groups), and education (2 groups).

*** Of the 105 fund managers who provided an expected return prediction, 96 also provided predictions about uncertainty, exposure to systematic risk, and earnings.

**** Of the 116 academic experts who provided an expected return prediction, 102 also provided predictions about uncertainty, exposure to systematic risk, and earnings.

Table continued on next page.

Table B.1 *(continued)* Overview of data collections

Population	Recruitment	n	Study content
Real news robustness study			
General population (US)	Prolific, September 2023	484	Between-subject design with real good and bad news for the company *Siemens Energy* (equal chances). Incentivized, quantitative return prediction. Incentivized investment decision.
Ruling out risk-based reasoning and beliefs in mispricing			
General population (US)	Prolific, June 2023	1,182	*Main study:* Experiment with three conditions. Equal chances of being in the control, a condition ruling out risk-based reasoning, and a condition ruling out beliefs in mispricing. Based on *Nike good news*.
General population (US)	Prolific, August 2024	906	*Extension:* Experiment with three conditions. Equal chances of being in the control, a condition ruling out beliefs in current *and future* mispricing, and a condition framing the news as expected. Based on *Nike good news*.
Attention study			
General population (US)	Prolific, June 2023	1,183	*Main study:* Experiment with three conditions. Equal chances of being in the control, a condition that draws attention to others' trading reactions, and a condition that additionally draws attention to price changes. Based on *Nike good news*.
General population (US)	Prolific, August 2024	603	*Extension:* Experiment with two conditions. Equal chances of being in the control and a condition that draws attention to others' trading reactions and price changes. Based on *Nike good news* but quantitative return expectations.
Return formula study			
General population (US)	Prolific, August 2024	1,034	Experiment with two conditions. Equal chances of being in the control (explanation of population growth) and a treatment condition (explanation of return formula). *Nike good news* prediction scenario.
Explaining equilibrium studies			
General population (US)	Prolific, August 2024	950	*Main study:* Experiment with two conditions. Equal chances of being in the control (explanation of population growth and an ecological principle) and a treatment condition (explanation of return formula and equilibrium pricing in financial markets). *Nike good news* prediction scenario.
General population (US)	Prolific, June 2023	947	*Extension:* Experiment with two conditions. Two waves. Wave 1: Equal chances of being in the control (explanation of tidal range) and a treatment condition (explanation of equilibrium pricing in financial markets). *Nike good news* prediction scenario. Wave 2: 588 of the initial participants. *Amazon good news* prediction scenario.

Table B.2 Summary statistics for the general population, retail investor, and financial professional samples

Variable	ACS/SCF (2022)	US gen. population	US retail investors	GER gen. population	GER retail investors	Financial advisors
Gender						
Female	50%	52%	39%	36%	12%	37%
Age						
18-34	29%	27%	40%	10%	15%	29%
35-54	32%	33%	45%	34%	46%	61%
55+	38%	41%	14%	56%	39%	9%
Household income						
Below 50k	34%	38%	0%	57%	23%	8%
50k-100k	29%	35%	8%	39%	44%	37%
Above 100k	37%	27%	91%	3%	32%	55%
Education						
Bachelor's degree or more	33%	47%	81%	49%	72%	72%
Region						
Northeast	17%	19%	24%			28%
Midwest	21%	21%	19%			15%
South	39%	40%	37%			36%
West	24%	20%	21%			22%
Assets						
Median total assets	36,810*	87,500	225,000	37,500	137,500	137,500
Stock owner	56%*	58%	94%	58%	97%	91%
Equity share among stock owners	44%*	43%	47%	41%	51%	37%
Median equity trades per quarter		0.5	2		2	
Role						
Advisor						50%
Trader						42%
Analyst						70%
Among advisors						
Mean years of advising experience						10
Median number of clients						22
Among traders						
Mean years of trading experience						9
Median annual trading volume						500,000
Sample size	1,980,550	2,434	408	3,852	299	406

*Financial benchmark characteristics are taken from the the Survey of Consumer Finance (2022, sample size: 4,595).

Notes: This table presents summary statistics for the US general population, US retail investors, German general population, German retail investors, and financial professional samples. It compares them to benchmark characteristics for the US adult population based on data from the American Community Survey 2022. For the German general population and the German retail investors, household income and assets are reported in euros, while they are reported in US dollars for all other samples. Reported income is annual gross income before taxes and deductions, except for the German general population, where it is annual net income after taxes. For the German general population, equity holdings include non-equity financial assets (other than bank accounts), such as bonds, which account for a very minor share of financial asset holdings in Germany.

Table B.3 Summary statistics for the expert sample

Variable	Academic experts
Personal characteristics	
Male	96%
Mean (median) years since PhD	18.57 (14)
Mean (median) publications in T5 Econ	1.67 (0)
Mean (median) publications in T3 Finance	4.21 (2)
Mean (median) h-index	20.98 (14)
Mean (median) citations	6,594.49 (1,626)
Location	
US-based	40%
Europe-based	48%
Sample size	116

Notes: This table displays the background characteristics of participants in the expert survey. These data are externally collected (i.e., not self-reported). "Mean (median) publications in T5 Econ" is the average (median) number of publications in five highly cited general-interest economics journals (the American Economic Review, the Quarterly Journal of Economics, the Journal of Political Economy, Econometrica, and the Review of Economic Studies). "Mean (median) publications in T3 Finance" is the average (median) number of publications in three highly cited finance journals (the Journal of Finance, the Journal of Financial Economics, and the Review of Financial Studies). "Mean (median) h-index" and "Mean (median) citations" are, respectively, the average (median) h-index and the average (median) total number of citations taken from respondents' Google Scholar profiles (as of August 2023).

Table B.4 Summary statistics for the additional experiments

Variable	ACS/SCF (2022)	Real news	Rule out risk & misp.	Ext: R/o risk & misp.	Attention	Ext: Attention quant.	Expl. return formula	Expl. eq. pricing	Ext: Expl. eq. wave 1	Ext: Expl. eq. wave 2
Gender										
Female	50%	49%	48%	49%	49%	49%	48%	51%	50%	47%
Age										
18-34	29%	43%	50%	45%	45%	52%	51%	50%	50%	47%
35-54	32%	40%	35%	44%	36%	38%	38%	39%	38%	40%
55+	38%	17%	14%	11%	19%	10%	11%	11%	13%	13%
Household net income										
Below 50k	34%	42%	39%	26%	39%	33%	30%	29%	37%	36%
50k-100k	29%	39%	36%	38%	35%	36%	37%	36%	36%	36%
Above 100k	37%	19%	25%	35%	26%	31%	33%	35%	28%	28%
Education										
Bachelor's degree or more	33%	55%	55%	64%	56%	60%	63%	63%	57%	58%
Region										
Northeast	17%	16%	19%	17%	15%	20%	17%	18%	19%	19%
Midwest	21%	21%	20%	18%	23%	18%	17%	17%	23%	24%
South	39%	42%	38%	45%	40%	47%	45%	41%	38%	38%
West	24%	21%	22%	21%	22%	15%	22%	23%	20%	20%
Assets										
Med. total fin. assets	36,810*	37,500	37,500	62,500	37,500	37,500	62,500	62,500	37,500	37,500
Stockowner	56%*	56%	57%	62%	58%	56%	62%	61%	58%	61%
Equity share among stock owners	44%*	34%	35%	35%	34%	36%	33%	36%	34%	33%
Sample size	1,980,550	484	1,182	1,183	1,034	950	947	588	906	603

*Financial benchmark characteristics are taken from the the Survey of Consumer Finance (2022, sample size: 4,595).

Notes: This table presents summary statistics for the US general population samples used in the *Real news robustness* study, the *Ruling out risk-based reasoning and beliefs in mispricing* study and its extension, the *Attention* study and its extension, the *Return formula* study, the *Explaining equilibrium study* and its two-wave extension. It compares the summary statistics to benchmark characteristics for the US adult population, derived from the American Community Survey 2022. Household income and assets are reported in US dollars. Reported income is annual gross income before taxes.

Table B.5 Balance tests for experiments

Differences in	*Differences across conditions*			
	Ruling out risk (treatment vs. control)	**Ruling out mispricing** (treatment vs. control)	**Ext.: Ruling out past and future mispricing** (treatment vs. control)	**Ext.: Expected news** (treatment vs. control)
Female (in pp)	0.000	−0.004	0.031	−0.002
Age (in years)	0.274	0.962	−0.389	0.921
Income (in $1k)	−1.320	6.629*	−2.749	−1.813
Bachelor's degree (in pp)	0.011	0.016	0.002	0.018
Region: Midwest (in pp)	0.009	−0.006	0.031	0.013
Region: South (in pp)	−0.032	−0.030	0.018	−0.054
Region: West (in pp)	0.002	0.058*	−0.062*	−0.001
Assets (in $1k)	-9.091	12.913	-5.421	25.245**
Stockowner (in pp)	-0.027	0.057	-0.012	-0.025
Joint F-test, p-value	0.968	0.395	0.835	0.260

Differences in	*Differences across conditions*			
	Real news robustness study (good vs. bad)	**Attention traders** (treatment vs. control)	**Attention traders & prices** (treatment vs. control)	**Ext.: Attention, quantitative** (treatment vs. control)
Female (in pp)	0.000	−0.010	−0.037	0.012
Age (in years)	−0.433	0.424	1.382	−0.940
Income (in $1k)	−2.705	5.571	−0.086	−3.084
Bachelor's degree (in pp)	−0.005	−0.004	−0.027	0.039
Region: Midwest (in pp)	0.007	−0.015	0.035	0.023
Region: South (in pp)	−0.008	−0.065*	−0.039	−0.023
Region: West (in pp)	−0.043	0.085***	0.042	−0.010
Assets (in $1k)	14.233	11.524	-0.948	10.131
Stockowner (in pp)	-0.025	0.083**	0.006	0.014
Joint F-test, p-value	0.675	0.063	0.394	0.795

Differences in	*Differences across conditions*			
	Explain return formula (treatment vs. control)	**Explain equilibrium pricing** (treatment vs. control)	**Ext.: Two-wave explain eq., wave 1** (treatment vs. control)	**Ext.: Two-wave explain eq., attrition** (non-attrited vs. attrited)
Female (in pp)	0.004	−0.061*	−0.015	−0.068**
Age (in years)	−0.999	−0.671	1.023	1.410
Income (in $1k)	−0.771	3.611	5.854*	1.531
Bachelor's degree (in pp)	0.000	−0.009	0.029	0.024
Region: Midwest (in pp)	−0.053**	0.027	0.003	0.038
Region: South (in pp)	0.022	−0.018	0.012	−0.001
Region: West (in pp)	0.031	−0.022	−0.005	−0.013
Assets (in $1k)	1.610	2.058	4.883	17.736*
Stockowner (in pp)	0.099***	0.014	0.018	0.097***
Joint F-test, p-value	0.011	0.627	0.809	0.044

Notes: This table presents balance tests for the experiments we conduct. It shows regressions of respondent characteristics on dummy variables indicating being in the treatment compared to the control condition as specified. The underlying samples consist of US general population respondents. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table B.6 Regressing directional return forecasts on respondent characteristics

	Financial advisors		US retail investors		GER retail investors		US general population		GER general population	
	Dummy for predictions: **Good news** ⇒ ...									
	Higher returns	Similar returns	Higher returns	Similar returns	Higher returns	Similar returns	Higher returns	Similar returns	Higher returns	Similar returns
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Female	0.045	0.044	0.097**	−0.037	0.145**	−0.096*	0.051	−0.016	0.007	0.007
	(0.047)	(0.036)	(0.041)	(0.033)	(0.064)	(0.054)	(0.035)	(0.031)	(0.029)	(0.027)
Age	0.003	−0.002	0.003**	−0.002*	0.002	0.000	0.004***	−0.003***	−0.001	0.003***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Bachelor's degree	0.130**	0.029	0.026	0.005	−0.075	0.054	−0.040	0.033	0.019	−0.045*
	(0.054)	(0.032)	(0.056)	(0.045)	(0.054)	(0.045)	(0.039)	(0.035)	(0.028)	(0.026)
Log income	−0.063	0.043	−0.002	0.048	−0.031	0.020	−0.001	0.010	−0.011	0.010
	(0.046)	(0.034)	(0.060)	(0.052)	(0.044)	(0.034)	(0.025)	(0.023)	(0.010)	(0.009)
Log assets	−0.015	0.008	−0.019	0.003	0.002	0.003	−0.005	−0.000	0.001	−0.012***
	(0.010)	(0.007)	(0.012)	(0.011)	(0.027)	(0.023)	(0.005)	(0.005)	(0.005)	(0.005)
Stock owner	−0.095	−0.013	−0.109	0.081	0.000	0.030	−0.003	0.016	0.119***	−0.050
	(0.099)	(0.075)	(0.086)	(0.073)	(0.145)	(0.107)	(0.046)	(0.041)	(0.035)	(0.032)
Fin. lit. (3/3) corr.	0.177***	−0.090**	0.110*	−0.075	0.099	−0.046	0.145***	−0.084**		
	(0.050)	(0.038)	(0.061)	(0.051)	(0.107)	(0.086)	(0.038)	(0.034)		
Constant	1.344***	−0.342	0.851	−0.376	0.895**	−0.106	0.480*	0.256	0.631***	0.175*
	(0.497)	(0.365)	(0.682)	(0.584)	(0.442)	(0.333)	(0.256)	(0.230)	(0.113)	(0.104)
Obs.	406	406	408	408	299	299	672	672	1,288	1,288
R^2	0.063	0.049	0.036	0.019	0.027	0.014	0.067	0.032	0.016	0.032

Notes: This table regresses respondents' directional return forecasts on a set of respondent characteristics, pooling across the *Nike good news* and the (reversely coded) *Nike bad news* survey arms. The outcomes are dummy variables for expecting the stock return over the next 12 months to be higher (lower) in the good news (bad news) scenario than in the neutral scenario (Columns 1, 3, 5, 7, and 9) or to be similar between the news and the neutral scenario (Columns 2, 4, 6, 8, and 10). The underlying samples are financial advisors (Columns 1 and 2), US retail investors (Columns 3 and 4), German retail investors (Columns 5 and 6), US general population respondents (Columns 7 and 8), and German general population respondents (Columns 9 and 10). In the surveys with German retail investors and the German general population, the scenarios use the fictitious company name "SportsApparel" but are otherwise identical to the "Nike" scenarios. For the German general population and the German retail investors, household income and assets are reported in euros, while they are reported in US dollars for all other samples. Reported income is annual gross income before taxes and deductions, except for the German general population, where it is annual net income after taxes. For the German general population, equity holdings include non-equity financial assets (other than bank accounts), such as bonds, which account for a very minor share of financial asset holdings in Germany. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table B.7 Quantitative return forecasts and investment decisions in the real news robustness study

	Expected return (in %)	**Share invested in stock** (in %)
	(1)	(2)
Good news	6.447***	26.723***
	(0.775)	(2.810)
Constant	4.246***	40.108***
	(0.607)	(2.169)
Observations	484	484
R^2	0.126	0.158

Notes: This table regresses a respondent's return forecast and investment decision on a dummy variable taking value one if the respondent was exposed to real stale good news regarding Siemens Energy's future earnings and value zero if the respondent was exposed to real stale bad news. The outcomes are a respondent's quantitative forecast of the return of the Siemens Energy stock over the next 12 months (Column 1) and the share of a £100 investment allocated to the Siemens Energy stock instead of a savings bond paying a fixed interest rate of 2% (Column 2). As preregistered, return predictions are winsorized at ± 30 pp. The underlying sample consists of US general population respondents. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table B.8 Regressing reasoning on respondent characteristics

	Financial advisors		US retail investors		GER retail investors		US general population	
	Dummy for reasoning (open-text data)							
	Efficiency	EP neglect	Efficiency	EP neglect	Efficiency	EP neglect	Efficiency	EP neglect
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female	−0.010	0.050	−0.041**	0.115**	−0.062	0.062	−0.011	0.052
	(0.014)	(0.048)	(0.018)	(0.046)	(0.045)	(0.090)	(0.007)	(0.038)
Age	−0.001	0.006***	−0.002**	0.001	−0.001	0.001	−0.001	0.005***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.000)	(0.001)
Bachelor's	0.013	−0.034	0.011	−0.004	0.075**	−0.067	0.010	−0.017
degree	(0.014)	(0.055)	(0.020)	(0.059)	(0.036)	(0.065)	(0.007)	(0.043)
Log income	−0.008	−0.032	0.059**	0.060	0.004	−0.031	−0.000	−0.023
	(0.016)	(0.055)	(0.025)	(0.076)	(0.029)	(0.050)	(0.008)	(0.027)
Log assets	0.002	−0.006	0.004	−0.002	0.034**	0.013	−0.000	−0.001
	(0.002)	(0.015)	(0.003)	(0.018)	(0.017)	(0.027)	(0.001)	(0.006)
Stock owner	0.015	−0.092	0.041***	−0.059	0.086**	0.026	−0.004	−0.027
	(0.013)	(0.096)	(0.016)	(0.101)	(0.038)	(0.182)	(0.010)	(0.047)
Fin. literacy	0.005	0.258***	0.034***	0.076	0.090***	0.134	0.025**	0.164***
(3/3 correct)	(0.016)	(0.051)	(0.010)	(0.066)	(0.028)	(0.117)	(0.011)	(0.042)
Constant	0.101	0.792	−0.700**	−0.108	−0.481*	0.595	0.032	0.479*
	(0.173)	(0.564)	(0.298)	(0.845)	(0.288)	(0.534)	(0.080)	(0.278)
Observations	406	406	408	408	299	299	672	672
R^2	0.009	0.101	0.041	0.020	0.050	0.013	0.018	0.070

Notes: This table regresses measures of the reasoning underlying respondents' return forecasts as expressed in the open-ended text question on a set of respondent characteristics, pooling across the *Nike good news* and the *Nike bad news* survey arms. The outcomes are dummy variables for expressing reasoning in line with market efficiency (Columns 1, 3, 5, and 7) – pooling the codes on information efficiency, changes in uncertainty, and changes in factor exposure – or with a neglect of equilibrium price adjustments (Columns 2, 4, 6, and 8) – pooling the codes on changes in earnings and investors' reactions – in the open-ended question. The underlying samples are financial advisors (Columns 1 and 2), US retail investors (Columns 3 and 4), German retail investors (Columns 5 and 6), or US general population respondents (Columns 7 and 8). In the survey with German retail investors, the scenarios use the fictitious company name "SportsApparel" but are otherwise identical to the "Nike" scenarios. For the German retail investors, household income and assets are reported in euros, while they are reported in US dollars for all other samples. Reported income is annual net income after taxes. The German general population survey does not include an open-ended question on reasoning due to space constraints. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table B.9 Return forecasts differ by underlying reasoning

	Dummy for news-congruent expected returns (Good news ⇒ higher exp. return *or* bad news ⇒ lower exp. return)						
	Academic experts	Fund managers	Financial advisors	US retail investors	GER retail investors	US general population	US general population
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Efficiency	−0.388***	−0.375***	−0.504***	−0.369***	−0.604***	−0.343***	−0.423***
	(0.129)	(0.099)	(0.043)	(0.092)	(0.052)	(0.121)	(0.054)
Neglect of eq. pricing	0.600***	0.562***	0.311***	0.446***	0.390***	0.455***	0.467***
	(0.128)	(0.089)	(0.049)	(0.050)	(0.052)	(0.032)	(0.020)
Constant	0.400***	0.437***	0.504***	0.486***	0.604***	0.468***	0.475***
	(0.128)	(0.089)	(0.043)	(0.048)	(0.052)	(0.028)	(0.018)
Scenario	Nike	Nike	Nike	Nike	Nike	Nike	All individual companies
Observations	111	98	406	408	299	672	1,605
R^2	0.681	0.602	0.146	0.334	0.599	0.263	0.285

Notes: This table regresses respondents' directional return forecasts on the reasoning underlying these forecasts as expressed in the open-ended question, pooling across the *Nike good news* and the *Nike bad news* survey arms (Columns 1–6) or pooling across all firm-specific survey arms (Column 7). The outcome is a dummy variable for expecting the stock return over the next 12 months to be higher (lower) in the good news (bad news) than in the neutral scenario. The independent variables are dummy variables for expressing reasoning in line with market efficiency – pooling the codes on information efficiency, changes in uncertainty, and changes in factor exposure – or with a neglect of equilibrium price adjustments – pooling the codes on changes in earnings and investors' reactions – in the open-ended question. The underlying samples are academic experts (Column 1), financial advisors (Column 2), US and German retail investors (Columns 3 and 4, respectively), and US general population respondents (Columns 5 and 6). 111 of the 116 academic experts and 98 of the 105 fund managers answered the open-ended question. In the surveys with German retail investors, the scenarios use the fictitious company name "SportsApparel" but are otherwise identical to the "Nike" scenarios. The German general population survey does not include an open-ended question on reasoning due to space constraints. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table B.10 Differences in reasoning explain differences in forecasts across samples

	Regressing on sample			Regressing on sample and reasoning		
	Dummies for predictions: **Good news** $\Rightarrow$ $\cdots$					
	Return higher	Return similar	Return lower	Return higher	Return similar	Return lower
	(1)	(2)	(3)	(4)	(5)	(6)
Fund managers	0.357***	−0.383***	0.026	0.035	−0.012	−0.024
	(0.061)	(0.064)	(0.047)	(0.041)	(0.043)	(0.043)
Financial advisors	0.539***	−0.609***	0.070*	−0.051	0.045	0.007
	(0.041)	(0.045)	(0.036)	(0.039)	(0.039)	(0.040)
US retail investors	0.626***	−0.600***	−0.026	0.024	0.052	−0.076**
	(0.040)	(0.045)	(0.034)	(0.037)	(0.039)	(0.037)
GER retail investors	0.593***	−0.559***	−0.034	0.086**	0.001	−0.086**
	(0.043)	(0.048)	(0.035)	(0.033)	(0.037)	(0.037)
US general pop.	0.549***	−0.523***	−0.026	0.003	0.108***	−0.111***
	(0.039)	(0.045)	(0.033)	(0.037)	(0.039)	(0.037)
Efficiency				−0.477***	0.686***	−0.209***
				(0.031)	(0.030)	(0.026)
EP Neglect				0.420***	−0.247***	−0.172***
				(0.021)	(0.018)	(0.017)
Constant	0.153***	0.730***	0.117***	0.485***	0.220***	0.295***
	(0.034)	(0.042)	(0.031)	(0.038)	(0.040)	(0.039)
Observations	1,994	1,994	1,994	1,994	1,994	1,994
R^2	0.091	0.118	0.016	0.390	0.423	0.084

Notes: This table examines whether differences in reasoning as expressed in the open-ended question can account for differences in directional return forecasts between academic experts and other investors, pooling across the *Nike good news* and the *Nike bad news* survey arms. The outcomes are dummy variables for expecting the stock return over the next 12 months to be higher (lower) in the good news (bad news) than in the neutral scenario, to be similar across scenarios, or to be lower (higher) in the good news (bad news) than in the neutral scenario. The independent variables are dummy variables indicating whether a respondent belongs to the financial advisors, US retail investors, German retail investors, or US general population sample (the academic expert sample being the omitted base category), and dummy variables for expressing reasoning in line with market efficiency – pooling the codes on information efficiency, changes in uncertainty, and changes in factor exposure – or with a neglect of equilibrium price adjustments – pooling the codes on changes in earnings and investors' reactions – in the open-ended question. The underlying sample pools academic experts, financial advisors, US and German retail investors, and US general population respondents. The German general population survey does not include an open-ended question on reasoning due to space constraints. 111 of the 11 academic experts and 98 of the 105 fund managers answered the open-ended question. In the survey with German retail investors, the scenarios use the fictitious company name "SportsApparel" but are otherwise identical to the "Nike" scenarios. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table B.11 Differences in structured reasoning across samples (compared to academic experts)

	Dummies: Reasoning according to structured question	
	Efficiency	Neglect of eq. pricing
	(1)	(2)
Financial advisors	-0.356^{***}	0.201^{***}
	(0.049)	(0.035)
US retail investors	-0.481^{***}	0.288^{***}
	(0.048)	(0.036)
US general population	-0.413^{***}	0.237^{***}
	(0.046)	(0.033)
GER general population	-0.462^{***}	0.184^{***}
	(0.042)	(0.027)
Constant	0.770^{***}	0.080^{***}
	(0.042)	(0.027)
Observations	2,862	2,862
R^2	0.036	0.014

Notes: This table regresses measures of the reasoning underlying respondents' return forecasts as expressed in the structured question included at the end of the survey on dummy variables indicating the different samples, where the omitted base category is the sample of academic experts, pooling across the *Nike good news* and the *Nike bad news* survey arms. The outcomes are dummy variables for reasoning in line with market efficiency and standard risk-based asset pricing – pooling the response options on information efficiency, changes in uncertainty, and changes in factor exposure – (Column 1) and for reasoning consistent with a neglect of equilibrium price adjustments – the response option indicating changes in earnings – (Column 2). The underlying sample pools academic experts, financial advisors, US retail investors, and US and German general population respondents. The German retail investor survey does not include an open-ended question on reasoning. Of the 116 academic experts, 100 answered the structured question. In the survey with the German general population, the scenarios use the fictitious company name "SportsApparel" but are otherwise identical to the "Nike" scenarios. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table B.12 Correlations between directional return expectations and other expectations: Additional specifications

Panel A: Financial advisors

	Dummy for predictions: **Good news ⇒ Higher return** or **Bad news ⇒ Lower return**				
	Main specification	Good news only	Bad news only	All years	Respondent FE
	(1)	(2)	(3)	(4)	(5)
Earnings $\mathbb{E}$ aligned	0.425***	0.459***	0.377***	0.382***	0.258***
	(0.046)	(0.068)	(0.069)	(0.029)	(0.038)
Uncertainty $\mathbb{E}$ aligned	0.143***	0.141**	0.151***	0.200***	0.235***
	(0.041)	(0.062)	(0.056)	(0.029)	(0.038)
Risk factor $\mathbb{E}$ aligned	−0.081*	−0.118*	−0.013	−0.013	0.053
	(0.044)	(0.061)	(0.062)	(0.030)	(0.037)
Others over-reacting†	−0.093*	−0.052	−0.136**		
	(0.051)	(0.079)	(0.069)		
Others under-reacting†	0.034	0.101	−0.033		
	(0.046)	(0.068)	(0.062)		
Constant	0.416***	0.370***	0.481***	0.256***	−0.114***
	(0.052)	(0.070)	(0.078)	(0.021)	(0.018)
Years	1	1	1	1-5	1-5
Scenarios	Nike	Nike good news	Nike bad news	Nike	Nike
Respondent FE	–	–	–	–	✓
Observations	406	192	214	2,030	2,030
R^2	0.280	0.332	0.214	0.201	0.492

Panel B: US retail investors

	Dummy for predictions: **Good news ⇒ Higher return** or **Bad news ⇒ Lower return**				
	Main specification	Good news only	Bad news only	All years	Respondent FE
	(1)	(2)	(3)	(4)	(5)
Earnings $\mathbb{E}$ aligned	0.388***	0.322***	0.579***	0.551***	0.507***
	(0.057)	(0.070)	(0.113)	(0.027)	(0.035)
Uncertainty $\mathbb{E}$ aligned	0.053	0.063	0.042	0.069**	0.195***
	(0.038)	(0.057)	(0.075)	(0.032)	(0.048)
Risk factor $\mathbb{E}$ aligned	0.073*	0.095*	0.036	0.123***	0.086*
	(0.038)	(0.055)	(0.052)	(0.033)	(0.050)
Others over-reacting†	−0.007	0.039	−0.082		
	(0.050)	(0.069)	(0.071)		
Others under-reacting†	0.143***	0.159**	0.125**		
	(0.043)	(0.065)	(0.053)		
Constant	0.388***	0.405***	0.258**	0.152***	−0.304***
	(0.060)	(0.073)	(0.115)	(0.017)	(0.021)
Years	1	1	1	1-5	1-5
Scenarios	Nike	Nike good news	Nike bad news	Nike	Nike
Respondent FE	–	–	–	–	✓
Observations	408	210	198	2,040	2,040
R^2	0.194	0.195	0.221	0.344	0.633

†Data are only available for year 1.

Table continued on next page.

Table B.12 *(continued)* Correlations between directional return expectations and other expectations: Additional specifications

Panel C: US general population

	Dummy for predictions: **Good news ⇒ Higher return** or **Bad news ⇒ Lower return**						
	Main specification	Good news only	Bad news only	All years	Respondent fixed effects	Individual company scenarios	Aggregate economy scenarios
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Earnings $\mathbb{E}$ aligned	0.416***	0.382***	0.434***	0.460***	0.313***	0.384***	0.382***
	(0.036)	(0.050)	(0.058)	(0.024)	(0.034)	(0.023)	(0.033)
Uncertainty $\mathbb{E}$ aligned	0.075**	0.154***	−0.005	0.134***	0.133***	0.070***	0.062*
	(0.033)	(0.048)	(0.046)	(0.025)	(0.035)	(0.022)	(0.034)
Risk factor $\mathbb{E}$ aligned	−0.012	−0.025	0.004	0.015	0.001	0.008	0.004
	(0.035)	(0.050)	(0.050)	(0.027)	(0.039)	(0.024)	(0.035)
Risk aversion $\mathbb{E}$ aligned							0.084**
							(0.034)
Interest rate $\mathbb{E}$ aligned‡							0.034
							(0.034)
Other over-reacting	−0.028	−0.040	−0.035			−0.001	−0.047
	(0.039)	(0.060)	(0.051)			(0.025)	(0.037)
Others under-reacting	0.039	0.051	0.027			0.062**	0.132***
	(0.038)	(0.056)	(0.052)			(0.025)	(0.035)
Constant	0.415***	0.392***	0.441***	0.233***	0.822***	0.427***	0.332***
	(0.036)	(0.047)	(0.058)	(0.016)	(0.017)	(0.024)	(0.032)
Years	1	1	1	1-5	1-5	1	1
Scenarios	Nike	Nike good news	Nike bad news	Nike	Nike	Individual company scenarios	Aggregate economy scenarios
Respondent FE	–	–	–	–	✓	–	–
Observations	672	337	335	3,360	3,360	1,605	829
R^2	0.211	0.216	0.200	0.243	0.576	0.185	0.219

†Data are only available for year 1. ‡Data are only available for the aggregate scenarios.

Notes: This table regresses respondents' directional return forecasts on their forecasts about other variables. The outcome is a dummy variable for expecting the stock return over the next 12 months to be higher (lower) in the good news (bad news) than in the neutral scenario. Columns 1, 4, and 5 pool the *Nike good news* and the *Nike bad news* survey arms. Columns 2 and 3 focus on the *Nike good news* and the *Nike bad news* arm, respectively. Columns 6 and 7 pool all scenarios for stocks of individual firms and the aggregate stock market, respectively. The independent variables are dummy variables indicating whether a respondent expects earnings, uncertainty of the return, the exposure of the return to circumstances investors deem unfavorable, i.e., to systematic risk, market participants' risk aversion, or interest rates to be higher (lower) in the good news (bad news) than in the neutral scenario, and dummy variables indicating whether the respondent increases (for bad news: decreases) the quantitative second-order return expectation more strongly (by more than 0.5pp) than the quantitative first-order expectation in response to the news ("Others over-reacting") and whether the respondent increases (for bad news: decreases) the quantitative first-order return expectation more strongly (by more than 0.5pp) than the quantitative second-order expectation ("Others under-reacting"). The underlying samples are financial advisors (Panel A), US retail investors (Panel B), and the US general population sample (Panel C). We focus on these samples as we elicit directional return forecasts for five horizons and quantitative first- and second-order return expectations in all of these data collections. Robust standard errors are in parentheses. Standard errors are clustered at the respondent level in Columns 4 and 5. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table B.13 Ruling out beliefs in mispricing: Extension

	Dummy for predictions: **Good news** ⇒ ...			**Reasoning**	
	Return higher	Return similar	Return lower	Neglect of eq. pricing	Efficiency
	(1)	(2)	(3)	(4)	(5)
News already expected	0.000	0.008	−0.008	0.006	0.018
	(0.036)	(0.032)	(0.023)	(0.039)	(0.016)
Ruling out current	0.044	−0.027	−0.017	0.060	0.013
and future mispricing	(0.035)	(0.031)	(0.022)	(0.037)	(0.016)
Constant	0.727***	0.184***	0.089***	0.664***	0.033***
	(0.026)	(0.022)	(0.016)	(0.027)	(0.010)
Observations	906	906	906	906	906
R^2	0.002	0.002	0.001	0.003	0.001

Notes: This regression table analyzes treatment effects of interventions that rule out beliefs in current *and future* mispricing or that frame the news as being expected. The experiment is based on the *Nike good news* scenario. The outcome is a dummy variable for expecting the stock return over the next 12 months to be higher in the good news than in the neutral scenario (Column 1), to be similar across the two scenarios (Column 2), or to be lower in the good scenario (Column 3), or a dummy variable for expressing reasoning in line with a neglect of equilibrium price adjustments – pooling the codes on changes in earnings and investors' reactions – (Column 4) or with market efficiency – pooling the codes on information efficiency, changes in uncertainty, and changes in factor exposure – (Column 5) in the open-ended question. The independent variables are dummy variables indicating whether a respondent is part of a specific treatment arm, where the control group is the omitted base category. The underlying sample consists of US general population respondents. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table B.14 Inattention to past price changes: Extension

	Expected return (in %)		
	Good news	Bad news	Difference Good news - Bad news
	(1)	(2)	(3)
Attention traders	0.169	0.035	0.134
& prices	(0.724)	(0.773)	(0.506)
Constant	17.050***	12.431***	4.619***
	(0.505)	(0.535)	(0.329)
Observations	603	603	603
R^2	0.000	0.000	0.000

Notes: This regression table analyses treatment effects of an intervention drawing attention to other traders' reaction and the price response on a respondent's quantitative return forecast of the Nike stock over the next 12 months. As preregistered, return predictions are winsorized at ± 30 pp. The underlying sample consists of US general population respondents. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table B.15 Explaining equilibrium: Extension with two-wave design

Panel A: *Explaining equilibrium* experiment: Wave 1 (scenario *Nike good*)

	Dummy for predictions: **Good news ⇒ ...**			**Reasoning**	
	Return higher	Return similar	Return lower	Neglect of eq. pricing	Efficiency
	(1)	(2)	(3)	(4)	(5)
Explain equilibrium	−0.205***	0.196***	0.009	−0.183***	0.110***
	(0.031)	(0.029)	(0.018)	(0.032)	(0.019)
Control	0.741***	0.181***	0.077***	0.635***	0.035***
	(0.019)	(0.017)	(0.012)	(0.021)	(0.008)
Observations	947	947	947	947	947
R^2	0.046	0.048	0.000	0.034	0.039

Panel B: *Explaining equilibrium* experiment: Wave 2 (scenario *Amazon good*)

	Return higher	Return similar	Return lower	Neglect of eq. pricing	Efficiency
	(1)	(2)	(3)	(4)	(5)
Explain equilibrium	−0.181***	0.115***	0.066***	−0.187***	0.078***
	(0.040)	(0.037)	(0.025)	(0.041)	(0.022)
Control	0.703***	0.228***	0.069***	0.575***	0.034***
	(0.026)	(0.023)	(0.014)	(0.028)	(0.010)
Observations	588	588	588	588	588
R^2	0.034	0.016	0.012	0.035	0.023

Notes: This table analyzes the treatment effects of interventions that explain the concept of equilibrium pricing to respondents before they make their return forecast in the two-wave experiment. Wave 1 is based on the *Nike good news* scenario (Panel A), where the follow-up wave 2 is based on the *Amazon good news* scenario (Panel B). The outcome is a dummy variable for expecting the stock return over the next 12 months to be higher in the good news than in the neutral scenario (Column 1), to be similar across the two scenarios (Column 2), or to be lower in the good news scenario (Column 3), or a dummy variable for expressing reasoning in line with a neglect of equilibrium price adjustments – pooling the codes on changes in earnings and investors' reactions – (Column 4) or with market efficiency – pooling the codes on information efficiency, changes in uncertainty, and changes in factor exposure – (Column 5) in the open-ended question. The independent variable is a dummy variable indicating whether a respondent received an explanation of equilibrium pricing, where the control group is the omitted base category. The underlying samples consist of US general population respondents. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table B.16 Robustness checks on pro-cyclical and extrapolative beliefs

Panel A: Pro-cyclicality

	Expected future return (DAX, 12 months, standardized)			**Exp. future return** (DAX, 12 months, >0)
	Main specification	Alternative EP neglect definition	Two-way clustered	Binarized LHS & RHS
	(1)	(2)	(3)	(4)
Expected growth	0.039***	0.038***	0.039**	
× Neglect of eq. pricing	(0.015)	(0.014)	(0.016)	
Expected growth	0.206***	0.211***	0.206***	
	(0.012)	(0.010)	(0.013)	
Exp. growth at least constant				0.043***
× Neglect of eq. pricing				(0.013)
Exp. growth at least constant				0.110***
				(0.010)
Respondent FE	✓	✓	✓	✓
Date FE	✓	✓	✓	✓
Observations	30,463	30,463	30,463	30,463
R^2	0.521	0.521	0.521	0.460

Panel B: Extrapolation

	Expected future return (DAX, 12 months, standardized)				**Exp. future return** (DAX, 12 months, >0)
	Main specification	Past 3-month return	Alternative EP neglect definition	Two-way clustered	Binarized LHS & RHS
	(1)	(2)	(3)	(4)	(5)
Past return/100	0.255***	0.330**	0.247***	0.255***	
× Neglect of eq. pricing	(0.078)	(0.161)	(0.078)	(0.079)	
Past return positive					0.031***
× Neglect of eq. pricing					(0.012)
Respondent FE	✓	✓	✓	✓	✓
Date FE	✓	✓	✓	✓	✓
Observations	30,463	30,463	30,463	30,463	30,463
R^2	0.498	0.497	0.498	0.498	0.449
Within R^2	0.001	0.000	0.001	0.001	0.000

Notes: This regression table reports robustness checks on the predictiveness of equilibrium pricing neglect for the tendencies to form "pro-cyclical" or extrapolative stock market return expectations. We use panel data from January 2021 until January 2024 on respondents to our German general population survey, which was included in the June 2023 wave of the Bundesbank Online Panel Households (BOP-HH). In Panel A (B), Column 1 corresponds to Column 2 (4) in Table 5 and regresses respondent i's subjective stock market return expectation for the next 12 months (5-point categorical scale, standardized) on the respondent's standardized expected growth for the next 12 months (%-realized stock market return over the past 12 months), interacted with a dummy indicating whether the respondent exhibits equilibrium pricing neglect according to their prediction in our survey module (making a news-congruent return prediction). In Panel A (B) Column 2 (3) shows robustness to an alternative proxy for equilibrium pricing neglect (making news-congruent predictions for the return *and* for earnings). In Panel B, Column 2 uses the realized return over the past three months. Column 3 (4) in Panel A (B) reports the main specification with standard errors two-way clustered at the respondent and the (daily) date level. Column 4 (5) in Panel A (B) regresses a dummy indicating whether the respondent expects a positive stock market return over the next 12 months on a dummy indicating whether the respondent expects growth to remain at least the same over the next 12 months (whether the realized stock market return over the past 12 months has been positive). Each household participates at most once in a given survey month, but the realized return and the date fixed effects are calculated on a daily basis. Standard errors clustered at the respondent level (unless noted otherwise) are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

C Additional studies

This appendix presents results from additional studies. Table C.1 presents an overview of our additional data collections. The survey instructions for the additional studies are available at https://osf.io/b83gf. Table C.3 provides summary statistics for the additional collections, while Table C.4 presents balance checks.

Table C.1 Overview of additional data collections

Population	Recruitment	n	Study content
Affect heuristic study			
General population (US)	Prolific, August 2024	199	Short survey. Respondents predict and explain return difference between events with good and bad affective valence but no consequences for future earnings of Nike.
Transfer of equilibrium reasoning studies			
General population (US)	Prolific, March 2024	1,311	*Collection 1:* Experiment with four conditions (2x2). Two waves. Wave 1: Equal chances of being in the control condition (explanation of the tidal range) and a treatment condition (explanation of equilibrium pricing in financial markets). *Nike good news* prediction scenario. Wave 2: 1,311 of the initial 1,518 participants. Between-subject design with real good news and real bad news for the company *Comcast* (equal chances, cross-randomized to condition in wave 1). Incentivized, quantitative return prediction. Incentivized investment decision. Beliefs about the stock market.
General population (US)	Prolific, March 2024	1,201	*Collection 2:* Experiment with four conditions (2x2). Two waves. Wave 1: Equal chances of being in the control condition (explanation of the tidal range) and a treatment condition (explanation of equilibrium pricing in financial markets). *Nike good news* prediction scenario. Wave 2: 1,201 of the initial 1,570 participants. Between-subject design with real good news and real bad news for the company *Siemens Energy* from 2023 (equal chances, cross-randomized to condition in wave 1). Incentivized, quantitative return prediction. Incentivized investment decision. Beliefs about the stock market.
General population (US)	Prolific, August 2024	2,295*	*Collection 3:* Experiment with four conditions (2x2). Two waves. Wave 1: Equal chances of being in the control (explanation of population growth and an ecological principle) and a treatment condition (explanation of return formula and equilibrium pricing in financial markets). *Nike good news* prediction scenario. Wave 2: 2,295 of the initial 2,997 participants. Between-subject design with real good and bad news for the company *Siemens Energy* from 2024 (equal chances, cross-randomized to wave 1 condition). Incentivized, quantitative return prediction. Incentivized investment decision. Beliefs about the stock market.

*806 of these respondents participated in the Explaining equilibrium study in August 2024 and we use this data as wave 1 for cost efficiency reasons.

C.1 Affect heuristic study

An alternative explanation for why households infer higher future returns from news of higher future earnings is that households apply a naive affective heuristic that simply connects news with a positive valence to higher future returns. To explore this possibility, we conduct another study in which households are presented with news with positive and negative valence that does not have any implications for future company earnings.

Sample We run the study with Prolific in August 2024. 199 US households participate.[1]

Design The study is similar to our main descriptive collections, but the scenarios feature four-week-old news that has different affective valence but no relevance for Nike's future business prospects. In particular, the scenarios feature either the death of a beloved ex-employee of Nike or the celebration of his 80th birthday. Respondents predict in which of the two scenarios the return of Nike stock will be higher over the next 12 months. Respondents also explain their return forecasts in an open-text box.

Results Only 16% of respondents predict higher future returns in the scenario with positive valence, while 79% do not predict any difference in future returns across the two scenarios. Households tend to explain their forecast by arguing that the scenarios do not matter for Nike's future business prospects. Thus, affective reasoning does not seem to be driving respondents' news-congruent return forecasts in our main scenarios.

C.2 Transfer of equilibrium reasoning study

In this appendix, we provide evidence from three "knowledge transfer" experiments. These experiments test whether households are able to apply newly acquired equilibrium knowledge in other contexts.

Sample We run the studies with Prolific in March 2024 (Collections 1 and 2) and August 2024 (Collection 3). 4,807 US households participate.[2]

[1] Summary statistics are shown in Table C.3. The experimental instructions are available at https://osf.io/b83gf.

[2] The reasons for the three collections are the following: (i) in Collection 1, control group respondents did not perceive the real-world news pieces as sufficiently different between the good and bad news arms, limiting our ability to test for the effect of acquiring equilibrium knowledge; (ii) both Collections 1 and 2 were imbalanced across the four treatment conditions; (iii) we modified the equilibrium explanation used in the mechanism Section 5.3 after Collections 1 and 2 and wanted to replicate the transfer experiment using the same equilibrium explanation as in the mechanism section. Our sample is balanced across conditions for most covariates (Appendix Table C.4). Given the minor imbalances, we made sure that our results are robust to including control variables. Summary statistics are shown in Table C.3. The experimental instructions are available at https://osf.io/b83gf.

Design Our design consists of two waves. Wave 1 contains our intervention explaining equilibrium pricing to respondents (see Section 5.3), followed by our standard *Nike good news* survey module.[3] Wave 2 is conducted one or two days after Wave 1 and measures the following outcome variables:

1. **Return forecast**: Respondents are cross-randomized into two conditions in which they receive a stale real-world piece of news with either positive or negative implications for future company earnings. These items are based on news about Comcast (Collection 1), news about Siemens Energy from 2023 (Collection 2), or news about Siemens Energy from 2024 (Collection 3). Subsequently, the respondents make an incentivized return forecast for the stock of the company.
2. **Investment decision**: Respondents also divide an investment of £100 for one year between the stock of the company for which they receive the news and a riskless saving bond paying a fixed interest rate.
3. **Perceived participation costs**: We elicit respondents' perceived importance of tracking company news for successful stock investment on a 5-point scale.
4. **Perceived risk-return relationship**: We measure respondents' beliefs about the relationship between a stock's risk and expected return on a 3-point categorical scale (only Collections 1 and 2).[4]

Empirical specification To estimate the causal effect of the newly acquired equilibrium knowledge on respondents' perceived participation costs and risk-return relationship, we use 2SLS specifications. We instrument "Considers EP$_i$" – a proxy for considering equilibrium pricing, namely a dummy that takes value one when respondents do *not* make a news-congruent return forecast in Wave 1 – with a dummy for whether respondents have received the equilibrium explanation:

$$y_i = \delta_0 + \delta_1 \widehat{\text{Considers EP}}_i + \omega_i \tag{3}$$

$$\text{Considers EP}_i = \alpha_0 + \alpha_1 \text{Explain equilibrium}_i + \varepsilon_i \tag{4}$$

where Equation 4 is the first and Equation 3 the second stage. Hence, δ_1 captures the causal effect of the newly acquired equilibrium knowledge on the outcome of interest, y_i.

To examine the effects of receiving stale good news (instead of stale bad news) on return forecasts and investment decisions depending on whether a respondent has acquired equilibrium knowledge, we estimate the following 2SLS interaction specification:

[3]While Collection 3 relies on the version of the equilibrium explanation that is preceded by an explanation of the return formula, Collections 1 and 2 use a version without the return formula explanation.

[4]We do not elicit the perceived risk-return trade-off in Collection 3 because the version of the equilibrium explanation used in that collection informs respondents, among others, that one can expect to earn a higher return when investing in riskier stocks.

$$
\begin{aligned}
(5) \qquad y_i = \delta_0 &+ \delta_1 \widehat{\text{Good news}_i \times \text{Considers EP}_i} \\
&+ \delta_2 \widehat{\text{Good news}_i \times \text{Neglects EP}_i} \\
&+ \delta_3 \widehat{\text{Considers EP}_i} + \omega_i \\
(6) \qquad \text{Good news}_i \times \text{Considers EP}_i = \alpha_0 &+ \alpha_1 \text{Explain eq.}_i \times \text{Good news}_i \\
&+ \alpha_2 \text{Control group}_i \times \text{Good news}_i \\
&+ \alpha_3 \times \text{Explain eq.}_i + \varepsilon_i \\
(7) \qquad \text{Good news}_i \times \text{Neglects EP}_i = \beta_0 &+ \beta_1 \text{Explain eq.}_i \times \text{Good news}_i \\
&+ \beta_2 \text{Control group}_i \times \text{Good news}_i \\
&+ \beta_3 \times \text{Explain eq.}_i + \eta_i \\
(8) \qquad \text{Considers EP}_i = \gamma_0 &+ \gamma_1 \text{Explain eq.}_i \times \text{Good news}_i \\
&+ \gamma_2 \text{Control group}_i \times \text{Good news}_i \\
&+ \gamma_3 \times \text{Explain eq.}_i + \upsilon_i
\end{aligned}
$$

where Neglects EP$_i$ takes value one if the respondent makes a news-congruent return forecast (i.e., it is defined as $1 -$ Considers EP$_i$) and Good news$_i$ is a dummy taking value one if the respondent receives good news (instead of bad news) about the company. Equations 6–8 are the first-stage equations for the three endogenous explanatory variables, and equation 5 is the second stage. Hence, δ_1 captures the causal effect of receiving good news on the outcome of interest among those who just acquired equilibrium knowledge, while δ_2 captures the effect among those who did not.

Results The results are presented in Table C.2. Column 1 pools all three collections, while Columns 2–4 show the results separately for each collection. Columns 5 and 6 split the sample into respondents with high and low financial literacy – i.e., those who answer correctly to all Big 3 questions and those who do not.

Panel A shows estimates of the first-stage effects of the explaining equilibrium intervention from estimating equation 4. The intervention generates a significant first-stage effect on equilibrium knowledge in all subsamples. On average, the tendency to not make a news-congruent return forecast increases by 19pp ($p<0.001$), slightly larger than in the main experiment presented in Section 5.3. We thus replicate these results in a much larger sample. This first-stage effect is almost twice as high among those with high financial literacy (23pp, Column 5) than those with low financial literacy (12pp, Column 6), potentially due to a higher ability to process the information. Our intervention thus generates a significantly stronger first stage among financially literate respondents ($p<0.001$).

Panels B and C examine the effects of receiving stale good versus bad news on the re-

turn forecast for the company stock and the amount invested in the stock depending on whether a respondent has or has not acquired equilibrium knowledge. The regressions are based on estimating the 2SLS interaction specification described in equations 5–8. On average, good news does *not* significantly affect return forecasts and investment among those who have acquired equilibrium knowledge. By contrast, being exposed to good news makes those who have not acquired this knowledge more optimistic about the return (on average 5pp, Panel B, Column 1, $p<0.001$) and increases their investment in company stock (on average 26pp, Panel C, Column 1, $p<0.001$). The effect sizes vary somewhat across collections. Although the differences in responses to good news between those who have acquired equilibrium knowledge and those who have not are economically large, they mostly do not reach statistical significance ($p = 0.159$ for return forecasts and $p = 0.077$ for the amount invested). This should be viewed in light of the high power demands of estimating an interaction effect, the fact that only 19% of respondents are shifted away from neglecting equilibrium pricing in the first stage, and the relatively noisy outcomes (in particular, the return forecast). When focusing on financially literate respondents, for which our first stage is much stronger, the investment response to good versus bad news differs more significantly between those who have acquired equilibrium knowledge and those who have not (Panel C, column 5, $p=0.039$).

Panels D and E display the effects of having acquired equilibrium knowledge on perceived stock market participation costs and risk-return relationship, estimating the 2SLS specification described in equations 3–4. Panel D highlights that, in two out of the three collections, acquired equilibrium knowledge significantly reduces respondents' tendency to view the tracking of company news as important for successful stock investment – thereby potentially reducing perceived stock market participation costs. As can be seen in Panel E, such knowledge also causes a reduction in respondents' tendency to believe in a reverse risk-return trade-off.[5]

[5]In unreported regressions, we observe that also the tendency to perceive a *positive* risk-return relationship is reduced by equilibrium knowledge. Here, the benchmark from standard theory strongly depends on whether the risk reflects exposure to a systematic risk factor or is idiosyncratic (in which case it should not be priced).

Table C.2 Results from the knowledge transfer experiments

Panel A: First stage (OLS)

	Considers equilibrium pricing (EP)					
	All	Experiment 1	Experiment 2	Experiment 3	High fin. lit.	Low fin. lit.
	(1)	(2)	(3)	(4)	(5)	(6)
Explain equilibrium	0.186***	0.212***	0.166***	0.180***	0.229***	0.116***
	(0.013)	(0.026)	(0.027)	(0.019)	(0.016)	(0.023)
Constant	0.245***	0.266***	0.246***	0.232***	0.195***	0.325***
	(0.009)	(0.017)	(0.017)	(0.012)	(0.010)	(0.015)
Observations	4,807	1,311	1,201	2,295	3,031	1,776

Panel B: Quantitative return expectations (2SLS)

	Quantitative return expectation (winsorized at $\pm$ 30pp)					
	(1)	(2)	(3)	(4)	(5)	(6)
Considers EP	0.189	0.981	3.931	−2.018	0.737	0.473
	(1.865)	(2.912)	(4.429)	(2.849)	(1.717)	(5.796)
Good news	5.150***	3.687**	5.530***	5.980***	5.094***	6.623**
× Neglects EP	(0.865)	(1.574)	(1.677)	(1.340)	(0.749)	(2.990)
Good news	1.645	2.942	−0.314	1.467	2.307	−0.974
× Considers EP	(1.676)	(2.568)	(3.543)	(2.779)	(1.594)	(4.892)
Constant	6.445***	7.603***	3.990***	6.958***	5.424***	7.729***
	(0.637)	(1.156)	(1.416)	(0.914)	(0.566)	(2.112)
First stage F-stat:						
Considers EP	179.958	62.917	29.07	88.94	198.533	19.68
GN × Neglects EP	206.64	71.539	36.704	95.884	227.302	23.947
GN × Considers EP	195.292	68.363	34.456	90.315	204.979	22.923
Wald Test (H_0: Good news × Considers EP = Good news × Neglects EP)						
Wald F:	1.98	0.03	1.38	1.25	1.51	0.93
p-value	0.159	0.854	0.24	0.264	0.22	0.335
Observations	4,807	1,311	1,201	2,295	3,031	1,776

Panel C: Investment decision (2SLS)

	Share invested in asset (in percent)					
	(1)	(2)	(3)	(4)	(5)	(6)
Considers EP	17.505**	24.106*	43.512**	3.881	20.555***	1.195
	(7.131)	(12.418)	(20.871)	(9.452)	(7.537)	(17.867)
Good news	26.184***	22.008***	36.950***	24.780***	28.867***	16.570**
× Neglects EP	(3.190)	(6.419)	(7.941)	(3.982)	(3.248)	(8.399)
Good news	9.907	1.050	0.524	17.048**	8.480	18.866
× Considers EP	(6.207)	(10.568)	(16.501)	(8.413)	(6.915)	(13.908)
Constant	38.598***	30.435***	30.423***	45.967***	39.423***	41.610***
	(2.455)	(4.965)	(6.744)	(3.044)	(2.524)	(6.557)
Wald Test (H_0: Good news × Considers EP = Good news × Neglects EP)						
Wald F:	3.14	1.6	2.46	0.4	4.28	0.01
p-value	0.0766	0.206	0.117	0.526	0.0387	0.917
Observations	4,807	1,311	1,201	2,295	3,031	1,776

Table continued on next page.

Table C.2 *(continued)* Results from the knowledge transfer experiments

Panel D: Participation costs (2SLS)

	Perceived participation costs (standardized)					
	All	Experiment 1	Experiment 2	Experiment 3	High fin. lit.	Low fin. lit.
	(1)	(2)	(3)	(4)	(5)	(6)
Considers EP	−0.658***	−0.827***	−1.177***	−0.280	−0.698***	−0.329
	(0.159)	(0.286)	(0.392)	(0.217)	(0.171)	(0.351)
Constant	0.219***	0.205*	0.324**	0.177**	0.103*	0.314**
	(0.055)	(0.108)	(0.131)	(0.072)	(0.056)	(0.133)
Observations	4,807	1,311	1,201	2,295	3,031	1,776

Panel E: Risk-return tradeoff (2SLS)

	Risk-return-relationship perceived negative				
	Experiment 1+2	Experiment 1	Experiment 2	High fin. lit.	Low fin. lit.
	(1)	(2)	(3)	(4)	(5)
Considers EP	−0.363***	−0.349***	−0.382**	−0.288***	−0.653**
	(0.100)	(0.121)	(0.169)	(0.099)	(0.323)
Constant	0.431***	0.421***	0.443***	0.395***	0.567***
	(0.036)	(0.047)	(0.057)	(0.035)	(0.126)
Observations	2,512	1,311	1,201	1,678	834

Notes: This table reports regressions analyzing the effects of explaining equilibrium pricing (EP) in the knowledge transfer experiments. All regressions and variables are described in detail in the text. In Panel B, we report the conditional F-statistic of Sanderson and Windmeijer (2016) for each instrumented variable. The underlying samples consist of US general population respondents. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table C.3 Summary statistics of the *Affect Heuristic* and *Transfer* experiments

			Transfer experiments			
Variable	**ACS/SCF (2022)**	**Affect heuristic**	**All**	**Exp. 1**	**Exp. 2**	**Exp. 3**
Gender						
Female	50%	51%	53%	47%	61%	53%
Age						
18-34	29%	57%	46%	43%	43%	50%
35-54	32%	34%	40%	43%	40%	38%
55+	38%	9%	14%	15%	17%	12%
Household net income						
Below 50k	34%	31%	32%	32%	33%	31%
50k-100k	29%	36%	37%	37%	38%	35%
Above 100k	37%	33%	32%	30%	29%	34%
Education						
Bachelor's degree or more	33%	57%	63%	65%	60%	63%
Region						
Northeast	17%	13%	19%	19%	18%	18%
Midwest	21%	22%	18%	18%	20%	18%
South	39%	39%	40%	40%	39%	41%
West	24%	26%	23%	23%	23%	23%
Assets						
Median total fin. assets	36,810*	62,500	62,500	62,500	37,500	62,500
Stockowner	56%*	67%	63%	64%	63%	62%
Equity share among stock-owners	44%*	34%	37%	38%	39%	35%
Sample size	1,980,550	202	4,807	1,311	1,201	2,295

*Financial benchmark characteristics are taken from the the Survey of Consumer Finance (2022, sample size: 4,595).
Notes: This table presents summary statistics for the US general population samples used in the *Affect heuristic* study as well as the *Transfer of equilibrium reasoning* studies and compares them to benchmark characteristics for the US adult population, derived from the American Community Survey 2022. Household income and assets are reported in US dollars. Reported income is annual gross income before taxes.

Table C.4 Balance tests for the *Transfer of equilibrium reasoning* experiment

		Differences across conditions		
Differences in	**All experiments** (treatment vs. control)	**Experiment 1** (treatment vs. control)	**Experiment 2** (treatment vs. control)	**Experiment 3** (treatment vs. control)
Female (in pp)	−0.021	−0.046*	0.012	−0.024
Age (in years)	0.127	−0.243	0.772	−0.042
Income (in $1k)	−1.901	−1.046	−5.565*	−0.409
Bachelor's degree (in pp)	0.004	0.044*	−0.048*	0.009
Region: Midwest (in pp)	−0.026**	−0.048**	−0.036	−0.008
Region: South (in pp)	0.032**	0.034	0.012	0.042**
Region: West (in pp)	−0.010	0.030	−0.023	−0.026
Assets (in $1k)	-1.807	1.283	-7.278	-0.792
Stockowner (in pp)	0.003	0.015	-0.012	0.005
Joint F-test, p-value	0.181	0.118	0.178	0.689

Notes: This table presents balance tests for the *transfer of equilibrium pricing* experiments. It shows regressions of respondent characteristics on dummy variables indicating being in the equilibrium pricing explanation condition. The underlying sample consists of US general population respondents. Robust standard errors are in parentheses. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

D Additional details on the empirical approach

D.1 Academic expert survey

Starting from the EconLit publication database, we manually identified the email addresses of all economists who have published at least one article with the JEL code "G: Financial Economics" in a set of leading finance journals or the "top five" economics journals in the years 2015–2019.

We consider the following journals:

- Journal of Finance
- Journal of Financial Economics
- Review of Financial Studies
- Review of Finance
- Journal of Financial and Quantitative Analysis
- Journal of Financial Intermediation
- American Economic Review
- Review of Economic Studies
- Quarterly Journal of Economics
- Journal of Political Economy
- Econometrica

We sent a link to our study to all of these economists by email. We did not send any reminders. In total, we contacted 2,876 economists. 116 economists responded to our survey, corresponding to a response rate of 4%, which is common for such expert surveys.

D.2 Hand-coding of open-ended responses

Each open-text response is assigned to a unique category depending on which line of reasoning is expressed by the respondent. Table D.1 provides a complete overview of all categories in our coding scheme together with examples. The coding scheme was devised before the main data collection and informed by both pilot interviews with households and leading asset pricing theories. Therefore, it contains standard risk-based asset pricing arguments, arguments related to temporary mispricing, and arguments revealing a neglect of equilibrium pricing. Responses that cannot clearly be assigned to one category are assigned to a residual category.

Table D.1 Overview of categories of the coding scheme

Category	Explanation	Example
Efficient markets		
Information efficiency	The expected returns are the same because the information has already been priced into the market over the past four weeks since the announcement.	"The announcement was 4 weeks ago so it is enough time to be priced in the market. It mentions that it has received a lot of attention already. [...]" (Academic expert)
Risk	The expected return is higher/lower/similar because the uncertainty of the company's future earnings is expected to be higher/lower/similar.	"I think it will be higher because of the increased risks. it will allow for more volatility and increase the return that can be gained. although this strategy is risky it could bring in more profit" (Retail investor)
Risk factor exposure	The expected return is higher/lower/similar because the risk factor exposure of the future stock return is expected to be higher/lower/similar.	"Negative news already impounded in price but Nike became riskier and the expected return is higher if you assume that the bad news is correlated is marginal utility growth. [...]" (Academic expert)
Risk aversion	The expected return is higher/lower/similar because market participants' risk aversion is expected to be higher/lower/similar.	Never assigned.
Risk-free rate	The expected return is higher/lower/similar because the interest rates are expected to be higher/lower/similar.	"If the interest rates are increased, I would figure it would increase the investment of stocks or any savings." (General population)
Temporary mispricing		
Overreaction	The expected return is higher or lower because investors initially overreact to the news, leading to a higher or lower return for some time until a correction occurs.	"I think there is a good chance that the market overreacted in the 4 weeks since the announcement. Therefore, there will be more upside to the stock in scenario two over the next 12 months." (Retail investor)
Underreaction	The expected returns are higher/lower because investors initially underreacted to the good/bad news, leading to a higher/lower return for some time until the news is fully incorporated in the price.	"In scenario 2, the surprise cost savings should lead to better bottom line. While the market probably reacted up right away during the previous 4 weeks, the upside is most likely not fully priced in." (General population)
Neglect of equilibrium pricing		
Earnings	The expected return is higher/lower/similar because the company's future earnings or performance are expected to be higher/lower/similar.	"Simply put, the second scenario would lead to a financial set-back for the company, as they are facing a 20 percent increase in production costs, cutting into the company's profits. The first scenario is more likely to get a good return for investors." (Retail investor)
Investors' reaction	The expected return is higher/lower/similar because investors' interest in or enthusiasm about the stock is higher/lower/similar.	"Since Nike maintained its supply, chain partnership, investors would feel more confident in Nike and the stock price would rise" (Financial advisors)
Residual category		
Other arguments	Any explanation that does not fit the above categories, including repetitions of the scenario text, confused responses, or responses that are too short or too ambiguous to be classified.	"There will be only modest gains in the first scenario and losses in the second." (Financial advisors)

Notes: This table provides an overview of the different categories in our coding scheme, an explanation for each category, and example extracts from the open-text responses.

D.3 Research transparency

Preregistration We preregistered our surveys and experiments at the AEA RCT Registry (AEARCTR-0011505). The preregistration includes details on the survey design, survey instructions, sampling process, planned sample size, exclusion criteria, and research questions. We provide an overview of all preregistrations online at https://osf.io/hjvr9. The following notes document two exceptions and four technical deviations from the preregistration.

- The German retail investor survey was accidentally not preregistered. However, it follows the same structure as the other descriptive main surveys.
- The analysis in Section 6 was not preregistered.
- The pre-registration of the fund manager survey indicated that we collaborate with one asset management company. We received fewer responses than we had hoped for, which is why we supplemented the data collection partnering with another asset management company. For these additional responses, we made slight adjustments to the survey, such as switching from the fictitious company name "SportsApparel" to the company "Nike" (as described in Appendix Table B.1).
- We preregistered randomization of the order of the response options for the directional return forecast over the next 12 months in our main descriptive surveys. This randomization was accidentally not implemented in the final collections. Since we find very similar results for good news (households and many professionals predict higher returns in scenario 2) and bad news scenarios (households and many professionals predict higher returns in scenario 1), we are not concerned that the order in which the scenarios are mentioned in the response options matters.
- During our data collection with financial advisors, we realized that we needed to apply more stringent quality controls. We screen participants with open-text responses that appear to refuse to engage with the question at all, for example, by pasting unrelated private text messages. We obtain 406 valid responses.
- We cannot exclude respondents with extreme response times in the German general population survey because response duration data are unavailable in the BOP-HH.

Ethics approval The study obtained ethics approval from the German Association for Experimental Economic Research (XUzKfPvU).

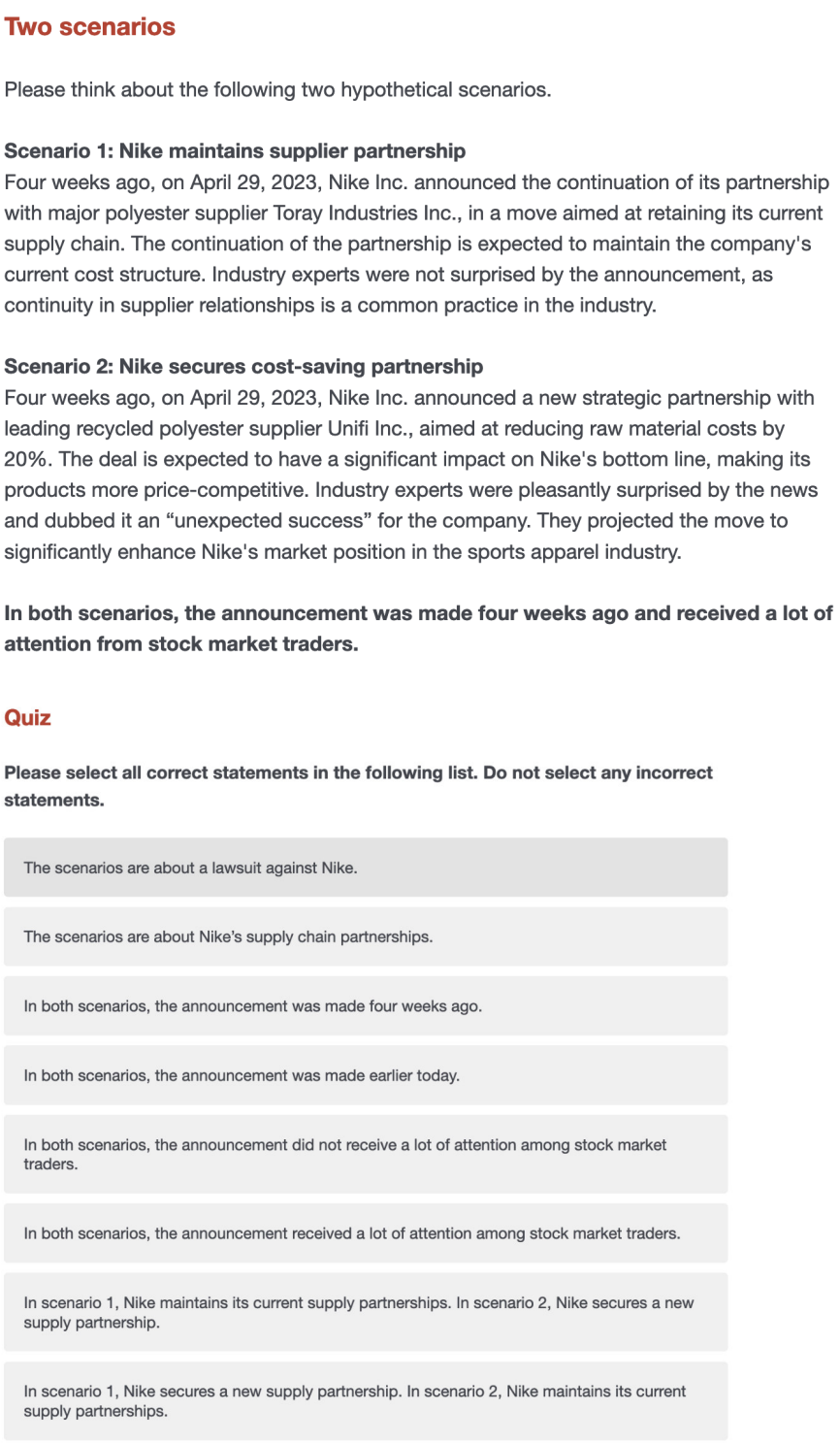
Data and code availability We will make all our data and code available upon publication. The Bundesbank Online Panel (BOP-HH) data are available upon request at the Bundesbank.

Conflicting interests We declare that we have no conflicting interests.

E Experimental instructions

This appendix contains the key instructions from our surveys and experiments. A complete overview of all survey instructions is available at https://osf.io/b83gf.

E.1 Main survey



Your prediction

Review the two scenarios *(click to open detailed description)*

▸ **Scenario 1: Nike maintains supplier partnership**

▸ **Scenario 2: Nike secures cost-saving partnership**

The announcements were made four weeks ago and received a lot of attention.

Imagine that you invest $1,000 in Nike stocks today, **four weeks after the announcement was made in the two scenarios**. Imagine that you sell these stocks in twelve months from now.

What would you expect? In which scenario would the return of this investment in Nike stocks be higher?

	The expected return would be …		
	higher in scenario 1	**similar in both scenarios**	**higher in scenario 2**
Return of investment over the next twelve months Invest $1,000 in Nike stocks today, *four weeks after the announcement*. Sell these stocks one year from now.	○	○	○

"Similar in both scenarios" means that the difference in returns is smaller than or equal to 0.5 percentage points.

How confident are you in your above prediction? Please answer on a scale from 1 (Not confident at all) to 6 (Very confident).

Not confident at all **1**	**2**	**3**	**4**	**5**	Very confident **6**

Important

On the next page, you will encounter an open question in which we will ask you to explain the prediction that you made on the previous page.

From our experience, it can take about **2 minutes** to complete this question.

Your responses are very valuable for this research project. Therefore, **please take your time to respond carefully.**

[PAGE BREAK]

Your explanation

Review the two scenarios *(click to open detailed description)*

▸ **Scenario 1: Nike maintains supplier partnership**
▸ **Scenario 2: Nike secures cost-saving partnership**

The announcements were made four weeks ago and received a lot of attention.

For the following investment ...

> You invest $1,000 in Nike stocks today, **four weeks after the announcement was made in the two scenarios**.
> You sell these stocks twelve months from now.

... you responded that you expect that the **return of the investment in Nike stocks would be [repeat response]**

Please explain why you think that would be the case.

Table E.1 Overview of all scenarios

Case	Scenario 1	Scenario 2
Nike, good news: New partnership	**Nike maintains supplier partnership** Four weeks ago, on [...], Nike Inc. announced the continuation of its partnership with major polyester supplier Toray Industries Inc., in a move aimed at retaining its current supply chain. The continuation of the partnership is expected to maintain the company's current cost structure. Industry experts were not surprised by the announcement, as continuity in supplier relationships is a common practice in the industry.	**Nike secures cost-saving partnership** Four weeks ago, on [...], Nike Inc. announced a new strategic partnership with leading recycled polyester supplier Unifi Inc., aimed at reducing raw material costs by 20%. The deal is expected to have a significant impact on Nike's bottom line, making its products more price-competitive. Industry experts were pleasantly surprised by the news and dubbed it an "unexpected success" for the company. They projected the move to significantly enhance Nike's market position in the sports apparel industry.
Nike, bad news: Loss of partnership	**Nike maintains supplier partnership** Four weeks ago, on [...], Nike Inc. announced the continuation of its partnership with major polyester supplier Toray Industries Inc., in a move aimed at retaining its current supply chain. The continuation of the partnership is expected to maintain the company's current cost structure. Industry experts were not surprised by the announcement, as continuity in supplier relationships is a common practice in the industry.	**Nike faces supply chain disruption** Four weeks ago, on [...], Nike Inc. announced that it is discontinuing its long-standing partnership with major polyester supplier Toray Industries Inc., in a move that is expected to increase the company's production costs by 20%. The sudden termination disrupts Nike's supply chain, leading to higher raw material costs. Industry experts were negatively surprised by the news and dubbed it an "unexpected setback" for Nike. They projected the move to significantly weaken the company's market position in the sports apparel industry.
Amazon, good news: Expansion in Africa	**No changes to Amazon's international strategy** Four weeks ago, on [...], Amazon announced that it would move forward with its current expansion plans in the e-commerce sector. As expected, no new country expansions were announced, and none of the existing expansion plans, such as in Africa and South America, were put on hold. The news came as no surprise to e-commerce experts.	**Amazon expands in Africa** Four weeks ago, on [...], Amazon announced that it would further increase its expansion efforts in Africa, launching its e-commerce business in Nigeria, Algeria, and Morocco later this year. A spokesperson for the company said that negotiations with authorities in these countries—which are among the largest economies on the continent—were proceeding at a faster than expected pace. E-commerce experts were surprised by the good news, and called it an "unexpected success" for the company.
Amazon, bad news: Withdrawal from South America	**No changes to Amazon's international strategy** Four weeks ago, on [...], Amazon announced that it would move forward with its current expansion plans in the e-commerce sector. As expected, no new country expansions were announced, and none of the existing expansion plans, such as in Africa and South America, were put on hold. The news came as no surprise to e-commerce experts.	**Amazon withdraws from South America** Four weeks ago, on [...], Amazon announced that it would be withdrawing from the South American e-commerce market. A spokesperson of the company said the company would end its operations in Brazil in the summer of 2023 and put any expansion plans to other countries in the region on indefinite hold. This decision has raised concerns about Amazon's expansion potential. E-commerce experts were surprised by the bad news, and called it a "significant setback" for the company.
Novartis, bad news: Loss of patent	**Novartis keeps exclusive right to sell heart drug** Four weeks ago, on [...], the Food and Drug Administration (FDA) upheld Novartis' right to the exclusive sale of the heart failure drug Entresto until at least 2028, banning any competitors from producing cheaper substitutes of the drug. This decision ensures that Novartis can continue to sell its drug without contest from competitors for at least five more years. The news came as no surprise to experts of the pharmaceutical industry, who predicted the company's profits to remain stable in the next few years.	**Novartis to lose exclusive right to sell heart drug** Four weeks ago, on [...], the Food and Drug Administration (FDA) rejected Novartis' right to the exclusive sale of the heart failure drug Entresto. The US regulator will open the market for competing generic drug makers, which plan to sell equivalent drugs at lower prices, starting in September this year. The decision is a significant setback for Novartis as the Entresto drug generated the second-highest revenue among all products sold by the company in the past year. Experts of the pharmaceutical industry were surprised by the bad news, calling it an "unexpected defeat" for the company.

Notes: This table provides an overview of all scenarios of the main general population survey.

Table E.1 *(continued)* Overview of all scenarios

Case	Scenario 1	Scenario 2
BioNTech, good news: Research breakthrough	**BioNTech's cancer drug still years away, market predictions confirmed** Four weeks ago, on [...], BioNTech, a German biotechnology company, announced slow but steady progress in its cancer treatment research. A company spokesperson reported on a recently concluded large-scale trial for its bowel cancer drug. The results were promising but indicated that the program still requires years of development before commercial roll-out. The news came as no surprise to industry experts.	**BioNTech reports unexpected breakthrough in cancer research** Four weeks ago, on [...], BioNTech unexpectedly announced a breakthrough in its cancer treatment research. Results published by the company after the conclusion of a large-scale trial indicate considerably stronger effects of an mRNA-based drug in treating bowel cancer compared to earlier trials, paving the way for a commercial roll-out of the drug later this year. Industry experts were surprised by the good news, and called it an "unexpected success" for the company.
Aggregate stock market, bad news: Negative oil price shock	**Crude oil production remains unchanged** Four weeks ago, on [...], oil producing countries in the Middle East announced that they plan to keep their crude oil production unchanged. Moreover, the countries announced that no changes to these plans are expected in the foreseeable future. Thus, the globally available amount of crude oil will remain roughly at the current level for the foreseeable future. The news came as no surprise to economic experts.	**Crude oil production sharply reduced** Four weeks ago, on [...], oil producing countries in the Middle East unexpectedly announced that they will sharply cut their crude oil production in Fall 2023. As a result, the globally available amount of crude oil will be substantially lower over the next years, putting pressure on crude oil prices and further exacerbating the existing energy crisis. Economic experts were surprised by the bad news, and called it a "worst-case scenario" for economic growth in the US.
Aggregate stock market, good news: Breakthrough in solar energy technology	**Development of solar energy technology proceeding as expected** Four weeks ago, on [...], it was revealed that the development of a new solar panel technology is progressing according to plan, with no significant delays or setbacks reported. The technology holds the potential to enhance the efficiency and affordability of solar power, but it will still require years of development before commercial roll-out. The news came as no surprise to experts.	**Breakthrough in development of solar energy technology** Four weeks ago, on [...], it became known that there was a groundbreaking advancement in renewable energy technology, enabling the production of solar power at a substantially lower cost. The innovation is anticipated to drive a rapid and substantial expansion of solar power generation, leading to significant energy cost reductions for businesses and consumers across the United States already by the end of this year. Experts were positively surprised by the announcement. They projected the news to generate "significant tailwind" for the US economy, boosting overall economic growth.
Aggregate stock market, good news: Fiscal policy shock	**No new government spending programs ahead** Four weeks ago, on [...], the government announced that there would be no new stimulus package aimed at boosting economic growth. Instead, the government plans to focus on other key issues during the current legislative period. Experts were not surprised by the announcement, citing previous statements from government officials.	**New government spending program to boost economy announced** Four weeks ago, on [...], the government unexpectedly announced a new large-scale stimulus package aimed at boosting economic growth by increasing spending on infrastructure projects and providing aid to struggling US businesses. Experts were positively surprised by the news, predicting that the stimulus package would provide a "significant boost" to the US economy.
Aggregate stock market, bad news: Monetary policy shock	**Interests rates remain unchanged** Four weeks ago, on [...], the Federal Reserve announced that it would keep interest rates unchanged, in line with market expectations. Experts were not surprised by the decision, which was seen as reflecting the current state of the economy. The move is expected to maintain stability in borrowing costs for businesses and consumers.	**Fed increased interest rates unexpectedly** Four weeks ago, on [...], the Federal Reserve unexpectedly announced a major increase in interest rates. The move follows a recent shift in the composition of the Fed committee, with newly appointed members holding more hawkish views. The move is expected to slow down economic growth by making borrowing more expensive for consumers and businesses. Experts were negatively surprised by the announcement and anticipate the hike to generate "significant headwinds" for the US economy.

Notes: This table provides an overview of all scenarios of the main general population survey.

E.2 Real news robustness study

Below, we provide the key instructions of the real news robustness study. We show the two news conditions and the elicitation of return expectations and investment decisions.

Condition: Good news

Four Months Ago: Siemens Energy Announces 7 Billion Euro Wind Power Deal

About four months ago, Siemens Energy made an announcement that received a lot of attention among stock market traders. Here is a summary of the news story.

> Siemens Energy, in partnership with Spain's Dragados Offshore, secured a multi-billion euro contract with TenneT, a prominent German-Dutch grid operator. The deal, worth nearly 7 billion euros, is aimed at enhancing the connectivity of wind farms in the North Sea to mainland Germany. This significant contract promises to increase the availability of renewable energy, as it allows for the transfer of up to 6 gigawatts of offshore wind power to the German electrical grid.
>
> The contract involves three key connectivity projects that will link wind-generated electricity from the North Sea to German cities. Siemens Energy will manufacture the main electrical components, such as switchgear, transformers, and converter technology. The projects are an extension of Siemens Energy's ongoing commitment to renewable energy, as the company recently secured similar large-scale contracts at the end of last year.

Recall: This news story broke around four months ago and received a lot of attention among stock market traders invested in or observing Siemens Energy's stock.

Condition: Bad news

Two Months Ago: Siemens Energy Retracts Forecast Amid Wind Turbine Crisis

About two months ago, Siemens Energy made an announcement that received a lot of attention among stock market traders. Here is a summary of the news story.

> Siemens Energy is grappling with a crisis due to complications in its wind turbine business. The company has retracted its annual forecast, warning of additional costs in the billions of euros. During a call with analysts, Siemens Energy CEO Christian Bruch admitted that the setback is more severe than he had anticipated. Technical checks on Siemens Energy's wind turbines have revealed "significantly increased" failure rates, with interim reports suggesting that many turbines will need to be replaced or repaired at a cost exceeding one billion euros.
>
> The challenges extend beyond technical issues; productivity improvements in the wind energy business have also fallen short of expectations. Additionally, Siemens Energy highlighted ongoing difficulties in ramping up manufacturing capacities in the offshore wind sector. As a result, Siemens Energy has retracted its profit forecast for the current fiscal year. Some experts started questioning whether Siemens Energy's wind turbine business is even capable of recovery.

Recall: This news story broke around two months ago and received a lot of attention among stock market traders invested in or observing Siemens Energy's stock.

Return expectations

Your prediction

Review the news story *(click to open detailed description)*

▸ **Four Months Ago: Siemens Energy Announces 7 Billion Euro Wind Power Deal**

Consider the following investment.

> Invest $1,000 in Siemens Energy stock today, **several weeks after the announcement was made**.
> Sell these stocks in twelve months from now.

Your task is to indicate which return you would expect for this investment.

Recall that the return of an investment in a stock is the percent change in value that you receive from investing in that stock. It includes both dividend payments and the change in the stock price. For comparison, the DAX—which is the German stock market index that represents the 30 largest companies—had an average annual return of 6% over the last ten years.

You can earn additional money based on your prediction. We will calculate the actual return of the investment in a year from now. If your prediction is at most 0.5 percentage points away from the actual return, we will transfer £2 to your Prolific account in a year from now.

Please predict which return you would expect for the above investment.

I predict a return of ...

[ ] %

Investment decision

An investment decision

Review the news story *(click to open detailed description)*

▸ **Four Months Ago: Siemens Energy Announces 7 Billion Euro Wind Power Deal**

In the following, we ask you to make a decision on how you would invest £100 for the coming 12 months.

You have the **chance to earn additional money** with your answer to this question. Upon completion of the study, we will randomly select ten participants who will receive a payout equal to the value of their investment after 12 months. If you are selected, this payout will depend on your investment decision, so please consider carefully. The payout will be made in 12 months (plus processing time) in the form of a Prolific bonus payment.

Two investment options are available:

- **Investing in a stock of the company *Siemens Energy.*** The return on your investment in Siemens Energy stock will be based on the actual return of this stock over the coming 12 months.
- **Investing in a savings bond that pays 2 percent interest per year for sure.** The return on your investment in the savings bond will be 2 percent for sure.

Please decide. How much of the £100 do you invest in *Siemens Energy* stock and how much in the savings bond?

(Note: The sum of your investments must amount to £100.)

My investment in the stock of *Siemens Energy*	£ 0
My investment in the savings bond	£ 0
Total	£ 0

E.3 Ruling out risk-based reasoning and beliefs in temp. mispricing

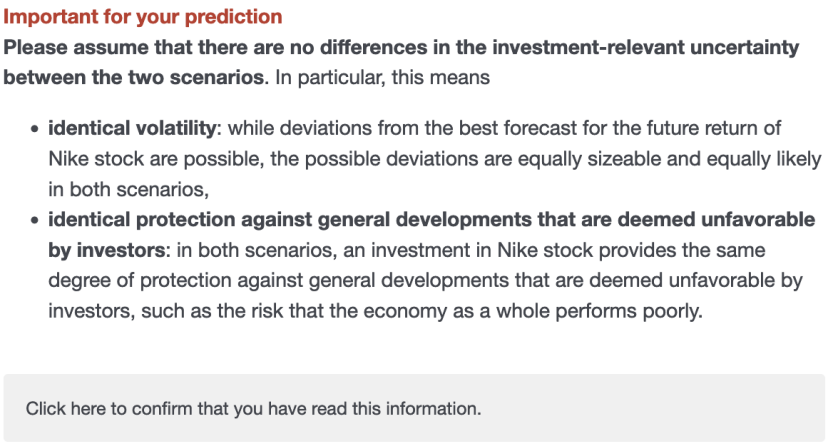
Below, we provide the key instructions for the modified prediction screens that respondents see in the experiment.

Control condition

Standard prediction screen as in main survey.

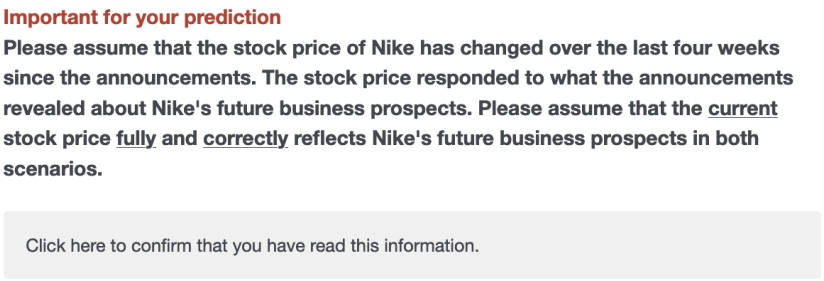
Condition: No changes in risk exposure

The prediction screen contains the following additional information directly before the forecast.



Condition: No temporary mispricing

The prediction screen contains the following additional information directly before the forecast.



E.4 Attention experiment

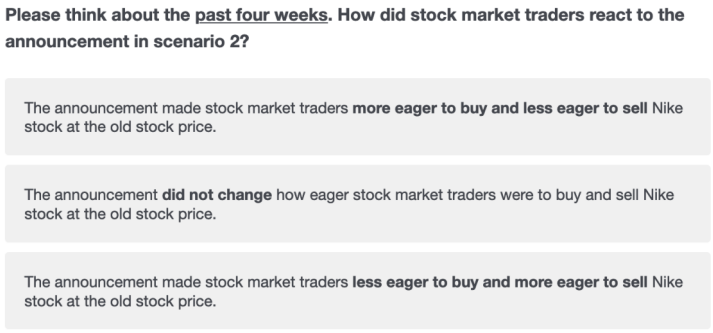
Below, we provide the key instructions for the modified prediction screens that respondents see in the experiment.

Control condition

Standard prediction screen as in main survey.

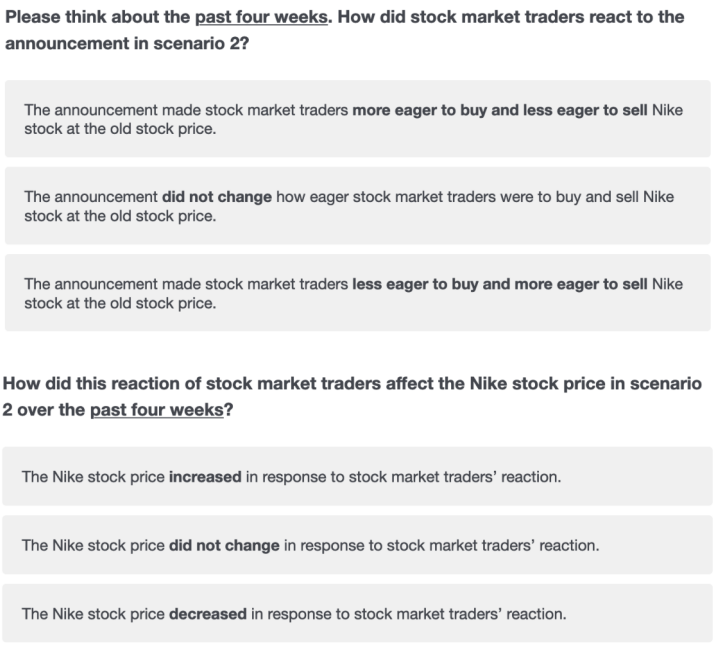
Condition: Attention to trading reactions

The prediction screen contains the following additional information directly before the forecast.



Condition: Attention to price reaction

The prediction screen contains the following additional information directly before the forecast.



E.5 Return formula study

Respondents in the treatment condition receive the explanation below. We also illustrate of how changes in the current stock price or the future stock revenue change the return (not shown below). Respondents then proceed to the *Nike good news* standard survey module with a modified prediction screen (shown below). Respondents in the control condition receive an explanation of population growth and then complete the standard *Nike good news* survey module with a standard prediction screen.

Return formula explanation

Stock returns: A closer look

We will now look in more detail into how the return of a stock is computed. Let's think of an investment of $100 into the stock of a company.

The return is the change in value that you can achieve with the investment:

Stock return = Future value – Current value

You invest $100 – this will be the current value. But what is the future value?

For each stock that you can buy today, you earn (what we call) the "stock revenue": the future price of the stock and the dividend the stock pays:

Future stock revenue = Future stock price + Dividend per stock

To get at the future value, we have to multiply the number of stocks you can buy today with the future stock revenue:

Future value = Number of stocks × Future stock revenue

To derive the number of stocks you can buy with $100 today, we need to divide the investment amount of $100 by the current stock price:

Number of stocks = $100 / Current stock price

This means that the return will be:

$$\text{Stock return} = \$100 \times \frac{\text{Future stock revenue}}{\text{Current stock price}} - \$100$$

This means that the return is higher when you get a higher future stock revenue (future stock price + dividend) relative to the stock price you pay today.

Intuitively, this makes a lot of sense. The return is higher when you get more (future stock revenue) for what you pay (current stock price).

Modified prediction screen

Your predictions

Now, we would like you to think about the return of this investment. Let's approach this step by step.

First, Nike's expected **future stock revenue** in twelve months from now would be …

- ◯ **higher in scenario 1.**
- ◯ **similar in both scenarios.**
- ◯ **higher in scenario 2.**

Second, Nike's **stock price** today, four weeks after the announcement was made, would be …

- ◯ **higher in scenario 1.**
- ◯ **similar in both scenarios.**
- ◯ **higher in scenario 2.**

Finally, please think about the return.

The expected **return** of a $100 investment in Nike stock over the next twelve months would be …

- ◯ **higher in scenario 1.** This means that you expect the future stock revenue relative to the current stock price to be higher in scenario 1.
- ◯ **similar in both scenarios.** This means that you expect the future stock revenue relative to the current stock price to be similar in both scenarios.
- ◯ **higher in scenario 2.** This means that you expect the future stock revenue relative to the current stock price to be higher in scenario 2.

"Similar in both scenarios" means that the difference in returns is smaller than or equal to 0.5 percentage points.

E.6 Explaining equilibrium study

Respondents in the treatment condition first receive the return formula explanation from the Return Formula Study. Then, they receive the explanation below. Subsequently, they proceed to the standard survey module (*Nike good news* case), with a modified prediction screen, as in the Return Formula Study. Respondents in the control condition receive an explanation of population growth and an ecological principle.

An important stock market principle

You just learned that the return on a stock investment is higher when you get a higher future stock revenue (future stock price + dividend) relative to the stock price you pay today.

But here is the crux: The current stock price usually depends on the future stock revenue expected by the market.

A higher expected future stock revenue means that a stock is more attractive. Because more traders want to own the stock today, the current stock price is higher. Hence, you pay for the higher expected future stock revenue with a higher stock price today.

Even more: if stock prices accurately reflect what is known about the future, the expected future success of a company does not matter at all for the expected future return of an investment in this company.

Yes, companies that are expected to perform well have a higher expected future stock revenue. But you also pay a higher price for their stock today because more traders want to own it. The combined effect is zero.

In fact, you can expect a similar return when investing in companies that are expected to perform worse. They have a lower expected future stock revenue, but you also pay a lower price for their stock today because fewer traders want to own it. And so the expected return of an investment in the company will be the same.

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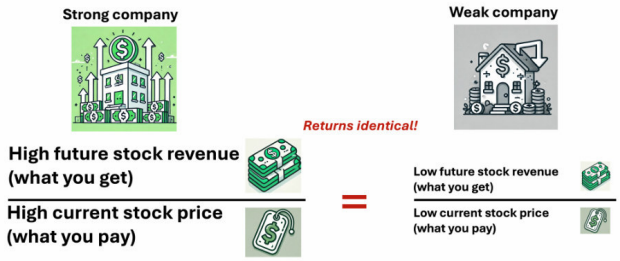
An important stock market principle

Put simply, if stock prices accurately reflect what is known about the future, the expected future success of a company does not matter for the expected future return of an investment in the company's stock.

You get what you pay for, and you pay for what you get.

The expected return is the same.



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Why does the principle hold?

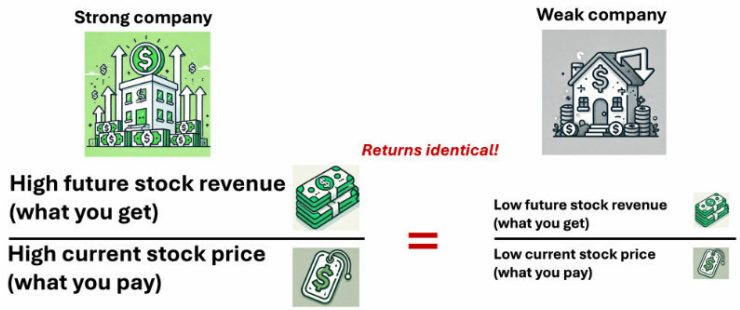
If stock prices accurately reflect what is known about the future, the expected future success of a company does not matter for the expected future return of an investment in the company's stock.

Why does the principle hold? This becomes clear if we think about what would happen if this principle did not hold.

Suppose that investing in high-earning companies was more lucrative than investing in low-earning companies because of their future expected earnings. This situation is unstable. Why? The answer involves four steps.

1. Stock traders obviously love lucrative investments. Hence, they would want to hold more lucrative high-earning companies and less low-earning companies.
2. This would trigger a change in stock prices. The demand for the stock of high-earning companies would be so high that their stock prices would rise, while the demand for the stock of low-earning companies would be so low that their stock prices would fall.
3. Investing in high-earning companies just became less lucrative because their stocks are now more expensive. Investing in low-earning companies just became more lucrative because their stocks are now cheaper. But the situation is still unstable as long as traders continue to find the high-earning companies more lucrative.
4. **As long as investments in high-earning companies remain more lucrative, this process will continue. Traders will continue to trade, and prices will continue to change until the expected earnings of companies do not matter for expected stock returns anymore.**

This is the only stable situation.



Hence, in the end, we would be back in a situation where higher expected future earnings of a company do not come with a higher future expected return of investing into the company stock.

[The explanation includes two further screens: one explains that returns could be predictably higher or lower due to changes in risk or mispricing, and one provides a summary.]

E.7 Additional questions from the BOP-HH survey

We make use of the following additional question on expectations about the development of the stock market and the overall economic growth that is regularly asked in the Bundesbank Online Panel Households (BOP-HH), into which our German general population survey was included:

> The next question is about your assessment of the general economic development in Germany over the coming twelve months.
>
> **Question:** What do you think, how will the following figures develop over the next twelve months? Will they ...
>
> [significantly decrease; slightly decrease; remain about the same; slightly increase; significantly increase]
>
> - economic growth in Germany
> - the German Stock Index