

Naive Asset Return Expectations: The Neglect of Informational Efficiency Application for the EPRN Network

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Background

What is driving stock price fluctuations? Answering this question is key for identifying risks in the financial system, for effectively regulating financial markets, and for designing optimal macroprudential, monetary, and stabilization policies. One key factor in models of asset prices are agents' beliefs about the expected return of an asset. These beliefs affect market participants' decisions of how much to invest in an asset and thereby drive asset prices. Importantly, both the beliefs of professional traders and those of households matter. While institutional investors are managing a large fraction of the wealth invested in the stock market, they are often subject to tight investment mandates. This implies that also smaller changes in asset demand due to changes in households' expectations can cause relatively strong price swings (Kojien and Yogo 2019; Gabaix and Kojien 2021).

In this project, we explore a specific bias in the formation of people's asset return expectations, which potentially helps to explain several "empirical puzzles" previously documented in the finance literature: the neglect of informational efficiency. Financial markets typically exhibit a high degree of informational efficiency as a consequence of information being available at low cost, high competition, and free market entry. Competitive traders respond to any signal about changes in business conditions, future profits, and likely dividends. Their continuously adjusted trading behavior will affect asset prices, until – in equilibrium – the prices reflect all available information. This process will take place very quickly, such that for the large majority of investors it should not be possible to achieve an abnormally high return by trading in response to public news. According to most asset pricing theories, expected returns are pinned down exclusively through the risk-free interest rate and a risk premium. The high degree of informational efficiency of financial markets implies that this condition will be met most of the time.

However, the reasoning behind informational efficiency is highly counter-intuitive. It requires individuals to understand that many market participants will have received public information, that they changed their investment behavior in response to this, and that this will be reflected in the new price of the asset.

Research question

Our hypothesis is that many stock market participants ignore the properties of informational efficiency. They work with a simple (but wrong) mental model in which the expected return of a stock is directly linked to the expected future profits or dividends of the firm. When good news about a firm's future profits arrive, individuals neglect that this will trigger an immediate stock price increase that largely offsets the increase in expected future dividends. Instead, they will think that investing in this firm's stocks will predictably yield a higher return.

In our project we aim to show that the neglect of informational efficiency shapes return expectations and investment behavior of retail investors which (1) comes at a cost to individual traders and (2) can provide a unifying behavioral foundation for empirically relevant phenomena such as over-extrapolation, the pro-cyclicality of return expectations, or over-trading on public information. We also aim to study the aggregate implications of naivety among investors for asset prices and optimal policies.

Approach

To empirically study neglect of informational efficiency, we conduct surveys among different groups of economic agents. In our surveys, we present participants with different hypothetical scenarios describing news about the future profits of a company. For instance, in one of these scenarios, respondents are asked to assume that Apple was successful in the development of a new generation of chips, and that this news arrived four weeks ago and was widely received by the public. They are then asked to predict the return of the Apple stock over each of the next five years under this scenario. We then compare respondents' predictions from the innovation scenario with their predictions from an alternative scenario under which the development of the new generation of chips failed. Under neglect of informational efficiency, respondents should predict higher expected returns under the innovation scenario. By contrast, if respondents fully accounted for price responses to the four-week-old news, they should predict similar expected returns in the two scenarios. We have developed tests to rule out all major alternative explanations for predicting higher returns in our "good news" scenarios, including explanations featuring beliefs about changes in risk or beliefs in sluggishness of price reactions in financial markets. We also elicit respondents' reasoning behind their predictions using both open-ended and more structured survey questions.

In previous pilot studies, we found widespread neglect of informational efficiency using this approach. We now would like to roll out this approach in samples from different countries and covering different types of economic agents. First, we would like to measure neglect of informational efficiency among large representative samples of the general population of different European countries and the US. Among others, we plan to use these samples to study how neglect of informational efficiency differs by education, financial literacy, and stock market involvement. Second, we have secured a collaboration with an online bank to conduct a survey measuring neglect of information efficiency among retail investors. Among others, this sample will allow us to study whether neglect of informational efficiency is predictive of certain types of trading behavior measured in matched administrative account data, such as over-trading on public information and return chasing. In earlier work, one of the co-authors successfully cooperated with an online bank conducting a field experiment merging survey and administrative account data (Laudenbach et al, 2022). Third, we plan to measure informational efficiency among more "professional" samples, such as experts including finance academics and financial analysts. We have successfully conducted expert surveys of this type in previous work using samples provided by the Munich-based ifo institute as well as databases compiled by ourselves (Andre et al, 2022a,b).

In the next step, we plan to conduct experimental studies including different de-biasing treatments, ranging from a brief text explaining informational efficiency to more extensive videos. First, these studies will shed light on whether people's mental models can be

persistently changed through simple interventions. Second, if these interventions are successful, they will allow us to study the causal effect of neglect of informational efficiency on other aspects of belief formation and on people's trading behavior. Specifically, we plan to use follow-up surveys to study the effect of the change in respondents' mental models caused by the intervention on the extrapolativeness and pro-cyclicality of their return expectations. Moreover, we include incentivized investment games, where participants allocate an amount between a risky asset and a safe asset, to shed light on effects on trading behavior. A random subset of respondents will be paid out according to their choices, which implies that we will require additional funding for these incentives.

Finally, we would like to explore the aggregate consequences of neglect of informational efficiency by incorporating such a belief formation mechanism into an otherwise standard asset pricing model. This will allow us to study the potential of neglect of informational efficiency to explain market level phenomena such as excess volatility of stock prices. Moreover, such a model can be used to evaluate the consequences of neglect of informational efficiency for the effect of policy interventions.

Policy relevance

Our findings have important policy implications. First, our findings contribute to our understanding of highly policy-relevant market-level phenomena such as the emergence of bubbles and irrational exuberance. For instance, neglect of informational efficiency can lead to overreaction to news, which may amplify asset price swings. Second, our findings have implications for private investors. A neglect of informational efficiency would imply that many retail investors invest suboptimally and lose money. Others might not even dare to invest in stocks because they mistakenly think they need much more information about the underlying businesses to make an informed investment decision. Based on our findings, policies could be designed which help mitigate these issues. For example, there could be a case for restricting investment products or advertisements exploiting individuals' tendency to neglect informational efficiency and over-trade on public information. Finally, the results of our de-biasing experiments are informative of the potential of educational interventions to improve individual decision-making in financial markets.

Literature and contribution

We contribute to an emerging literature that uses survey data to understand expectation formation in financial markets. Our results provide a unifying behavioral foundation for two of the most puzzling findings in this literature. First, large fractions of investors tend to extrapolate previous return developments despite the close to zero empirical autocorrelation of annual stock returns (Greenwood and Shleifer, 2014; Laudenbach et al, 2022, Vissing-Jorgensen, 2003). In a recent handbook chapter, Barberis (2018) names understanding the root causes of the extrapolative nature of individuals' return expectations and asset demand as one of the most important research questions in finance. To the extent that past returns reflect news about future business prospects and dividends, neglect of informational efficiency will lead investors to extrapolate past realized returns. The second puzzling finding in this literature is the procyclicality of investors' return expectations (Giglio et al, 2021; Amromin and Sharpe, 2014). Specifically, individuals tend to believe that high expected economic growth translates into high expected stock returns, even though,

empirically, expected returns tend to be highest during recessions, when investors demand the highest compensation for bearing risk. Given that high expected economic growth tends to be associated with expectations of high profits and dividends, neglect of informational efficiency also provides an explanation for this phenomenon.

We also speak to a theoretical literature exploring the equilibrium consequences of biases in investors' expectation formation. Barberis et al (2015) show that including a fraction of naive extrapolating investors into an otherwise standard asset pricing model can explain many stylized facts about asset prices. Bastianello and Fontanier (2021) show that partial equilibrium thinking can lead to bubbles and crashes in asset markets. Glaeser and Nathanson (2017) highlight how neglect of other market participants' responses to news leads to extrapolation and affects price dynamics in the housing market. Our results provide the first direct empirical evidence on a form of partial equilibrium thinking – the neglect of informational efficiency –, informing future modeling efforts.

Expected output and publication potential

We expect to produce one or two very strong academic papers. We have studied expectation formation of households and experts in previous projects, which were published in leading journals such as the *Review of Economic Studies*, the *American Economic Review: Insights*, the *Journal of Financial Economics*, the *Review of Economics and Statistics*, and the *Journal of Monetary Economics*. Two of these publications resulted from a previous project funded by EPRN (published in the *Review of Economics and Statistics* and the *Journal of Monetary Economics*). Households' and professionals' beliefs and mental models in finance contexts are under-studied. The few related papers were published in top 5 economics journals or in the top 3 finance journals. We believe our paper will have substantial impact and will have good chances of being published on the highest level.

Our previous work on how people think about the macroeconomy also attracted a lot of interest by popular media outlets. Among others, our research was covered by the *New York Times*, the German news outlets *Frankfurter Allgemeine Sonntagszeitung* and *SPIEGEL*, and an IMF column directed at policymakers and practitioners. We expect even more coverage here because the results are directly relevant to everyone investing in the stock market.

Table 1: Timeline

<u>Date</u>	<u>Item</u>
December 2022 - October 2023	Field work, data collection and analysis
November 2023 - February 2024	Write-up of the paper(s)
March 2024 - December 2024	Presentation of the paper(s) at workshops and conferences to promote the paper and get feedback. Incorporation of feedback.
January 2025	First submission to an academic journal

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