

EXPECTATION ERROR IN EARNINGS FORECASTS: A BEHAVIORAL PERSPECTIVE

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ABSTRACT

Prior studies on price sensitivity to earnings surprises explicitly and implicitly assume that analyst expectation is identical to investor expectation. This article demonstrates the misspecification problem of the existing studies and suggests testable hypotheses that are not subject to such assumption. I propose that instructors and researchers theoretically and empirically examine the naïve expectations and rational expectations hypotheses (NEH and REH) and other variations (behavioral expectations hypotheses - BEH) when they study market efficiency.

NAÏVE VERSUS RATIONAL EXPECTATIONS HYPOTHESES

There is growing evidence, not all of it in agreement, of systematic patterns in analysts' forecasts (e.g., optimistic, pessimistic, or rational). We refer to investors' failure to adjust their own expectations due to known or knowable bias in analysts' forecasts as the Naïve Expectations Hypothesis (*NEH*). If investors incorporate their knowledge of such systematic patterns in making adjustments to analysts' forecasts, or display other behavioral tendencies themselves, rather than naïvely accepting analysts' forecasts at face value, then the *NEH* is invalid. On the other hand, rational investors fully adjust for analysts' optimism by discounting analysts' optimistic forecasts, or fully account for analysts' pessimism by adding a "pessimism premium" to pessimistic forecasts. Based on this reasoning, an alternative hypothesis to the *NEH* is defined as the hypothesis that investors rationally adjust for observed analysts' forecasting behavior, and will be called the Rational Expectations Hypothesis (*REH*).¹

Investors have access to information about prior forecast errors, so a likely way of discovering analysts' behavior is to analyze patterns in historical data. This is why bias persistence, if it exists, is an important empirical trait relative to the question of how analysts' optimism or pessimism incorporated into investors' expectations about future earnings. Testing the *NEH* against the *REH* will provide an empirical answer to this question.

The *NEH* expresses a view that investors take analysts' forecasts as unbiased. This prediction leads to the conclusion that naïve investors' reaction, as captured by the announcement period excess return associated with a given analyst forecast error (holding other factors constant), does not vary systematically with the estimable bias in analysts' forecasts. The *REH*, in contrast, presumes that investors apply an "earnings-expectation discount" to forecasts characterized by optimistic bias, and add an "earnings-expectation premium" to those having pessimistic bias. Recognizing that investors' earnings expectations entail discounts or premia relative to observed analysts' forecasts gives rise to our

Table 1 summarizes the empirical regularities that we expect will be useful in distinguishing between the *NEH* and *REH*, which rely on the existence and *ex ante* identification of earnings forecasts that vary

¹ While analysts' earnings forecasts are observable, investors' earnings expectations are not. Investors' earnings expectations can be indirectly inferred by examining the two proposed hypotheses: *NEH* and *REH*.

with respect to the direction and degree of bias. In sum, for any given forecast error, $FE = A - F$, the rational market reaction should be algebraically smaller (larger) in response to perceived analysts' pessimism (optimism) in forecasts. The naïve market reaction to a given forecast error should be the same irrespective of analysts' bias.

Table 1. Analysts' Earnings Forecasts versus Investors' Earnings Expectations and Predicted Cumulative Abnormal Returns (CARs)

	<i>Hypothesis</i>	
<i>Portfolio</i>	<i>Naïve Expectations Hypothesis (NEH)</i>	<i>Rational Expectations Hypothesis (REH)</i>
<i>Optimistic Portfolio</i>	$IE _{NEH}^{OPT} = F$ $\rightarrow A - IE _{NEH}^{OPT} = A - F$ $\rightarrow CAR _{NEH}^{OPT} = CAR _{NEH}$	$IE _{REH}^{OPT} < F$ $\rightarrow A - IE _{REH}^{OPT} > A - F$ $\rightarrow CAR _{REH}^{OPT} > CAR _{NEH}$
<i>Rational Portfolio</i>	$IE _{NEH}^{RAT} = F$ $\rightarrow A - IE _{NEH}^{RAT} = A - F$ $\rightarrow CAR _{NEH}^{RAT} = CAR _{NEH}$	$IE_t _{REH}^{RAT} = F$ $\rightarrow A - IE _{REH}^{RAT} = A - F$ $\rightarrow CAR _{REH}^{RAT} = CAR _{NEH}$
<i>Pessimistic Portfolio</i>	$IE _{NEH}^{PESS} = F$ $\rightarrow A - IE _{NEH}^{PESS} = A - F$ $\rightarrow CAR _{NEH}^{PESS} = CAR _{NEH}$	$IE _{REH}^{PESS} > F$ $\rightarrow A - IE _{REH}^{PESS} < A - F$ $\rightarrow CAR _{REH}^{PESS} < CAR _{NEH}$

Definitions of variables are as follows:

- $IE|_{HYP}^{BIAS}$ = naïve or rational (*HYP*) investors' earnings expectations in response to analysts' *BIAS* [=optimism (*OPT*), rational forecasts (*RAT*), or pessimism (*PESS*)] in consensus earnings forecasts under *HYP* (=NEH or REH);
- F = analysts' consensus earnings forecasts;
- $A - IE|_{HYP}^{BIAS}$ = investors' expectation errors under *HYP* in response to analysts' *BIAS*;
- $A - F$ = analysts' forecast errors (*FE*);
- $CAR|_{NEH}$ = naïve investors' reaction to analysts' forecast errors manifested in 3-day cumulative abnormal returns (*CARs*); and
- $CAR|_{HYP}^{BIAS}$ = naïve or rational (*HYP*) investors' reaction to analysts' *BIAS* in consensus earnings forecasts.

CONCLUDING REMARKS

Prior studies testing the price sensitivity to earnings surprises assume that analyst expectation is identical to investor expectation, since measuring investor expectation is extremely tough task and investors deem to be naïve. However, this assumption may not be appropriate but problematic. Investor expectation is unlikely to mirror analyst expectation and likely to reflect the forecasting behavior of analysts. This article proposes that the existing functional forms to test the investor reaction to earnings surprises may be misspecified and suggests two testable hypotheses – the NEH and REH – given the

systematic forecasting behavior of analysts. Note that the rejection of the REH does not automatically lead to the acceptance of the NEH, since the NEH is a special type of the various behavioral expectations hypotheses (BEH). It is an empirical question whether investors rationally react to systematic expectations error in analysts' earnings forecasts and it is worthwhile investigating the discrepancy between investor and analyst expectations. The empirical results of such research will provide important investment implications to both investors and regulators.

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