Long Term Expectations and Aggregate Fluctuations: Comment

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1 Introduction

This paper, Bordalo et al. [2023], is the latest in a series of interesting and thought-provoking papers by the authors (along with other co-authors) using survey data to help explain/understand classic questions in macro and finance: what are the fundamental drivers – and the associated mechanisms – of fluctuations in aggregate economic activity and asset prices? What is the role of behavioral biases in these phenomena?

The primary contribution here is to make the case that forecasts of equity analysts of long term earnings growth rates (LTG) are key to understanding movements in financial market variables and macro aggregates. The forecast data come from IBES, who ask their respondents to report the expected operating earnings growth over the company’s next full business cycle, defined as a period of over 3 to 5 years. In addition, respondents also report forecasts of earnings (in levels, usually on a per share basis) at short horizons (usually a couple of years from the reporting date).

A few comments about the coverage of the data on this dimension are in order. Most stocks (over 75%) in the S&P 500 index have LTG entries in any given year, with an average number of analysts reporting LTG around 2. Both these metrics show a declining trend over the last two decades. For comparison, coverage for short horizon forecasts has been relatively more stable, with almost all firms in the S&P 500 reporting forecasts in a given year and an average of 15-20 reporting analysts. Despite the lower coverage for the LTG forecasts, the composition of analysts making those forecasts is tilted, if only slightly, towards the more prolific and accurate analysts, a reassuring pattern. Finally, a number of LTG forecasts are accompanied by a price target, which lines up reasonably well with the value implied by the LTG forecast.

An important concern is whether analysts are adapting their forecasts in response to changes in stock prices – or more generally, learning from market prices as in Grossman and Stiglitz (1980). In a recent paper, Chaudhry (2023) tests exactly this hypothesis exploiting plausibly exogenous mutual fund flow-induced trading. He finds that exogenous price increases raise both LTG and short-term forecasts. The magnitudes are consistent with the interpretation that analysts are revising their forecasts to rationalize observed price changes. This concern also gains some steam from the observation that other long-term forecasts (such as the 10 year GDP growth forecasts from the Survey of Professional Forecasters) seem to be much more stable. In other words, if LTG movements do indeed reflect beliefs about long-run fundamentals, they seem to be predominantly those of equity market participants.

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1The use of earnings growth – as opposed to say, dividend growth – is common practice in the literature, since data on the latter are available only for more recent time periods.

2For this purpose, prolific and accurate are defined as being above median in terms of the number of forecasts and below median in terms of mean-squared error.
The authors try to address this concern in a companion paper – Bordalo et al. (2022). Specifically, in that paper, the authors report that (i) about a third of the variation in revisions to LTG are explained by past LTG and sustained earnings growth while past returns do not add much explanatory power and (ii) LTG predicts future stock returns even after controlling for price-earnings ratios. They interpret these findings as evidence that LTG is not simply the result of analysts mechanically reverse-engineering market prices (and are consistent with a model of extrapolative behavior). These are reassuring findings, but only modestly so. While they do point to a component of LTG that is distinct from the information contained in prices, the extent to which that component drives the excess volatility and the investment effects – the objects of interest in this paper – is less clear. More work is needed – perhaps incorporating IVs – to isolate the effects of extrapolative biases.

A related concern stems from agency frictions. It is well-known that sell-side equity analysts’ forecasts show significant evidence of positive bias (i.e. analysts are systematically over-optimistic about earnings). This is often attributed to the fact that sell-side equity analysts are effectively paid by investment banking or trading businesses – see, e.g., Michael and Womack (1999) and Jackson (2005). The positive bias is apparent in the LTG data as well – the average LTG is significantly higher than realized earnings growth. Bordalo et al. (2023) effectively assume that this is likely to be a time-invariant bias and so can be ignored while studying fluctuations. They also argue that this is especially likely to be the case for large stocks. It would be nice to see evidence, even if suggestive or anecdotal, supporting these claims. It is not unreasonable to conjecture that the incentives for equity analysts to distort fluctuate with conditions in the investment banking business. One strategy would be to use proxies for these conditions (e.g. deal flows) as controls.

The first set of results emphasized in the paper relate to the well-known excess volatility puzzle in Shiller (1981). Shiller showed that, if we assume rational expectations and a constant required rate of return, the observed variability of dividend growth implies an upper bound for the volatility of the price-dividend ratio. Since dividend growth in the data is quite stable, the bound is also quite low, far below the observed volatility in that ratio. This striking finding has sparked a large literature that tries to resolve this puzzle. This body of work is too voluminous to survey here, so I will confine myself to mentioning a couple of the more well-known resolutions here. One influential approach is based on time-variation in discount rates (more precisely, in risk premia) – e.g. as in Campbell and Cochrane (1999), Bansal and Yaron (2004) or Wachter (2013). Another approach departs from rational expectations, for example by introducing learning, as in Barsky and De Long (1993).

The authors perform a simple experiment to demonstrate an alternate resolution using survey evidence on LTG. They construct an expectations-based index of stock prices over
time using a time-invariant discount rate and the observed LTG forecast at each $t$ (suitably aggregated from stock-level forecasts) for the expected earnings growth for years $t+2$ through $t+10$. Short-run forecasts and current earnings are used for horizons shorter than 2 years while the terminal growth rate (beyond year 10) is set to match the average level of stock prices in the sample.

$$\tilde{p}_t = e_t + g_{t+1} + \alpha g_{t+1,t+2} + \sum_{s=2}^{10} \alpha^s LT G_t + \frac{\alpha^{10}}{1-\alpha} g$$

(1)

This price series displays considerably higher variability relative to Shiller’s rational expectations benchmark and does remarkably well in matching the observed price fluctuations, especially at the low frequency. The paper then makes the case that this volatility is the result, at least partly, of systematic departures from rationality. It does so by showing that LTG systematically predicts future forecast errors at both long and short horizons: a high LTG forecast today is associated with positive forecast errors in the future. There is also a positive, albeit weak, relationship between LTG and expected returns from the Richmond Fed’s CFO Survey. In other words, high LTG (and arguably therefore, high equity valuations) is associated with high expected returns, which is contrary to the predictions of models with time-varying discount rates. In those models, high valuations are associated with low risk premia and therefore, low expected returns.

The next set of results examine the ability of LTG revisions to predict changes in interest rates, credit spreads and investment. They show that an upward revision to LTG is associated with higher short- and long-term interest rates, both contemporaneously as well as over the following 3 quarters. Further out, the relationship turns negative, arguably due to reversal of the initial uptick in LTG. The opposite pattern is observed in credit spreads (tightening at short horizons followed by widening), though the relationship is weaker.

The investment results show a striking pattern: an upward revision to LTG sparks an almost immediate investment boom with the investment-capital ratio rising by about 3 percent over a horizon of 3 quarters and then reversing these gains at a horizon of 7-10 quarters. To tie the reversal to the predictable reversal in ‘optimism’, a fitted value for future forecast errors (obtained by regressing observed forecast errors on the level of LTG) is added to the regression and shown to account for the entire future reversal. These patterns hold both at the aggregate and firm-level.

These findings are very interesting but also somewhat puzzling. In a simple neo-classical

\[3\text{It might be helpful to use the fitted forecast error specification for the other results in the paper as well, e.g. the interest rate and credit spread effects.}\]
setting, an upward revision in long-run productivity growth tends to cause an investment slump in the short run. This is a well-known issue (often referred to as the co-movement puzzle) in the literature on news shocks – see, e.g., Jaimovich and Rebelo (2009). A possible resolution acts through a financial accelerator channel (among other ingredients – see Christiano and Motto (2014)). A natural direction for future research is to evaluate this hypothesis with a full-fledged quantitative model but independently, it might be useful to look for reduced-form evidence supporting this financial channel. The results on interest rates and spreads are suggestive but can be strengthened further by looking at quantity variables as well. For example, is the investment boom sparked by an LTG revision accompanied by firms raising capital, whether in the form of debt or equity? As with the investment regressions, this exercise can be made more convincing by running them at both the aggregate and firm levels.\footnote{In the absence of financial frictions, it is not clear that firms should raise investment in response to over-optimism in stock markets (unless, of course, the firm is also subject to the same bias).}

The last set of results extend the analysis to other macro variables – GDP, consumption, employment, wages and inflation. The patterns are similar to those for investment – an upward revision to LTG acts like a ‘positive’ business cycle shock in the short run (3-4 quarters) which largely reverses itself over a longer horizon (6-10 quarters ahead).\footnote{Again, here it would be helpful to see the extent to which the reversal can be explained by the predictable component of future forecast errors.} The LTG is also shown to be correlated with the Marginal Efficiency of Investment shock, which Justiniano et al. (2011) argue plays a dominant role in US business cycle fluctuations.

Interpreting these results as the discovery of a new factor (a ‘miracle’ variable, as the authors term it in the Introduction) driving volatility in economic activity and financial markets might be premature. At the very least, it remains to be shown that LTG fluctuations can quantitatively account for the business cycle data. Second, it is not clear how we can distinguish LTG from other contenders for that title, especially if LTG partly reflects (to the extent analysts are changing their forecasts in response to stock market valuations) those factors.

In summary, Bordalo et al. (2023) is a valuable addition to an influential agenda and contains a wealth of results spanning many important topics in macroeconomics and finance. It also raises interesting questions about belief formation and mechanisms through which it affects the economy – questions which will spark and guide future work in this important area.\footnote{To cite a few, in addition to the MEI shock of Justiniano et al. (2011), we also have risk shocks from Christiano and Motto (2014) and the confidence shock in Angeletos et al. (2018).}
References


