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Information aggregation around macroeconomic announcements: Revisions matter[☆]

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ABSTRACT

I show that an empirical relation exists between stock returns on macroeconomic news announcement days and the future revisions of the released data but that this link differs across the business cycle. Using three major macroeconomic series that undergo significant revisions (nonfarm payroll, gross domestic product, and industrial production), I present evidence that daily returns on the Standard & Poor's 500 index and revisions are positively related in expansions and negatively related in recessions. The results suggest that revisions do matter, i.e., that investors care about the final revised value of a macroeconomic series, that they infer accurate information from the release of the preliminary inaccurate report, and that the more precise information is aggregated into prices on the day of the initial announcement. The results are consistent with the predictions of rational expectations trading models around public announcements combined with well-established empirical results on the asymmetric interpretation of information across the business cycle.

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1. Introduction

Macroeconomic announcements undergo significant revisions in the months and sometimes years following their initial release. The revisions represent the addition of new information in the statistical agencies' reports that was not available to them at the time of the original announcement. Rational investors should take this imprecision into account when analyzing the initial report and act accordingly, filtering out the noise and responding to the information conveyed by the preliminary announcement about the variable's correct (revised) value and not only its preliminary (unrevised) value. However, this inference process has been overlooked by the previous literature analyzing the impact of macroeconomic releases on asset returns.

McQueen and Roley (1993), Fleming and Remolona (1997, 1999), and Andersen, Bollerslev, Diebold, and Vega (2007), among many others, test whether the release of public macroeconomic information moves asset prices. While these papers have provided strong evidence that announcement surprises do move asset returns, the explanatory power of the event study regressions is typically very small. Based on the magnitude of the revisions that macroeconomic variables undergo, I posit

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that markets not only react to the contemporaneous surprises but also focus on the information conveyed by the initial release about the true underlying value that will ultimately be released much later. Because revisions are almost guaranteed to occur, the inference that investors make from the newly released data about the revised value must be taken into account if we are to fully understand the information aggregation process that occurs around public announcements.

In this paper, I ask whether the inherent inaccuracy of macroeconomic announcements matters, i.e., do revisions matter? Rational expectations models of trade around public announcements such as Kim and Verrecchia (1991), among others, yield the following predictions. First, the release of more precise announcements should have a higher price impact (Hautsch and Hess, 2007). Second, announcement-day returns should be negatively related to the future revision of the released announcement. The latter hypothesis stems from the fact that, in equilibrium, an above-average signal moves prices up even though the revision is expected to be negative.[1] By taking into account this inference process, which happens when imprecise public announcements are made, I test whether markets care about the true value of initially inaccurate public information releases.

Empirically, I show that a strong relation exists between announcement-day returns and the future revisions of the released macroeconomic data but that this link differs across the business cycle. Returns and revisions are positively related in expansions and negatively related in recessions. In terms of magnitude, an expected upward revision of 100,000 employees to the month's nonfarm payroll announcement by the Bureau of Labor Statistics (BLS) leads to an 18 basis point increase in the Standard & Poor's (S&P) 500 index on announcement day during expansions and a 77 basis point decrease in the index during recessions.[2] In dollar terms, this announcement error of 100,000 jobs is equivalent to an average daily change in the market value of the index of \$10 billion in expansions and \$43 billion in recessions. Furthermore, the addition of the revisions as an independent variable significantly increases the R^2 of the event study regressions explaining announcement-day returns (almost double in recessions).

Federal statistical agencies such as the BLS significantly revise macroeconomic variables during the months and even years following the initial announcements. Early revisions (one to three months) mainly stem from reports or surveys that are submitted late by firms or individuals. Each month, the agencies extrapolate from the sample of reports received in order to obtain an economy-wide estimate. Annual revisions (one to five years) arise because of updates of the economy-wide benchmarks, such as the total number of workers or firms. Both early and annual revisions reflect the addition of new information in the agencies' reports that was not available to them at the time of the initial announcement. Infrequent methodological revisions are put in place by statistical agencies so as to improve the measurement of economic trends. Their impact on the choice of data vintage is discussed in Section 4.

I define the sample-based early revisions of a macroeconomic announcement as the difference between the number available one to two months after the initial release and the original announced value. By extrapolating this definition, I define the final revision as the difference between the number available after as many rounds of revisions as possible (in May 2010 when the analysis was conducted) and the original announced value. The initial announcement surprise is defined as the difference between the realization of the announcement and the market median (consensus) expectation collected shortly prior to the announcement. It is important to note that final revisions of nonfarm payroll, gross domestic product (GDP), or industrial production are of the same order of magnitude as initial surprises, both in terms of mean and standard deviation.

I follow the previous literature in labeling a macroeconomic announcement that is above expectations as good news if it indicates an increase in economic activity. For instance, a positive surprise in nonfarm payroll (announcement of 90 thousand versus an expectation of 75 thousand) or a positive surprise in GDP is defined as good news. Similarly, an unexpected increase in unemployment (announcement of 9.8% versus an expectation of 9.6%) is defined as bad news.

Standard rational expectations models of trade around public announcements yield unambiguous predictions about the relation between expected future revisions of the information releases and announcement-day returns. The relevant theoretical literature is discussed in Section 3. In these, rational investors know that public signals are noisy estimates of the true underlying state. They therefore take into account the noise in the releases: A release that is above expectations (above average) is expected to be revised downward in the future, and vice versa for a release that is below expectations. However, in equilibrium, the signals enter prices with the "right" (positive) sign: Good signals lead to an increase in prices, and vice versa, even though the increase is not as large as the actual release would suggest because rational investors expect the downward revision. The natural conclusion of these rational models in which good news moves prices up is that announcement-day returns and future data revisions are negatively related.

An increase in nonfarm payroll can lead to an increase or a decrease in stock prices depending on the interpretation of the information. For example, a monetary response framework implies that, following good news, the Federal Reserve might increase interest rates to avoid overheating and control inflation, which would be bad news for stocks. Furthermore, such interpretation could vary across the business cycle: In the depth of a recession, an increase in payroll is typically good news because it indicates that firms are hiring in expectation of increased consumer demand. As a result, whether good news moves stock

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[1] The presence of noise in the signal makes the upward change in price smaller than it would have been otherwise.

[2] In my sample, this is roughly equal to a one standard deviation shock to nonfarm payroll revisions, which happens to be roughly equal to the average announced value of monthly nonfarm payroll changes.

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