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The heterogeneous impact of macroeconomic information on firms' earnings forecasts[☆]



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A B S T R A C T

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This paper re-examines the role of macroeconomic information in forecasting firm earnings. We adopt a Fama–MacBeth regression model with the important extension of including information from over 140 macroeconomic variables that enter into the model in a reduced dimension form as a consequence of common factor analysis. The resulting factor-augmented model is then used to evaluate the importance of macroeconomic information on earnings forecasts for U.S. firms from 1962 to 2009. The same model is also examined for each individual time window and industry subsample. The results reveal a clear and heterogeneous impact of macroeconomic information on firm-specific earnings forecasts, and that these effects differ markedly during certain periods and across industries. In addition, when compared to analyst forecasts, we show that our model is generally more accurate over longer forecast horizons. The results of the identified heterogeneous impacts are used to define the conditions under which macroeconomic information becomes important for the firm.

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1. Introduction

It is well known in the financial economics literature that the macroeconomic environment has a strong impact on the financial positions of firms. Among others, [Brown and Ball \(1967\)](#) show that realised corporate earnings are strongly associated with changes in macroeconomic conditions. A related body of literature uses stock prices to reflect firm value and documents that stock prices do respond to macroeconomic news in various ways (e.g., [Boyd, Hu, & Jagannathan 2005](#); [Gertler & Grinols 1982](#); [McQueen & Roley 1993](#)), reasoning that macroeconomic forces can affect stock prices through their influence on expected earnings. This is intuitive because stock prices reflect the present value of a firm's current and future financial performance. Given that earnings persistence is a broadly accepted property in the literature,¹ it follows that the impact of macroeconomic information on current earnings should also persist into future earnings. However, the existing empirical research does not provide clear evidence on whether and how macroeconomic information influences market participants' expectations of future earnings. For example, [Ackert and Hunter \(1995\)](#) suggest that macroeconomic information helps predict firm earnings. In contrast, [Boyd et al. \(2005\)](#) find no statistically significant impact of macroeconomic news on earnings growth forecasts.

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¹ [Penman \(1991\)](#), [Lakonishok, Shleifer, and Vishny \(1994\)](#), and [Fama and French \(1995\)](#) identify the role of lagged earnings in future earnings.

Given the importance of the issue, this study re-examines the role of macroeconomic information when forecasting firm earnings. For this purpose, we adapt and extend the earnings forecast model used by Hou, van Dijk, and Zhang (2012), which builds on the widely used Fama–MacBeth regression framework, to include four macroeconomic factors that are derived from a principal component analysis of over 140 macroeconomic variables. We follow Stock and Watson (2008) to summarise information from a large set of macroeconomic series into a few principal component factors. Doing so eliminates the arbitrary reliance on several pre-selected macroeconomic variables. The resulting factor-augmented earnings forecast model is then used to evaluate the importance of macroeconomic information in predicting earnings one, two and three years ahead, in accordance with common forecast horizons used in the literature. We first investigate the role of macroeconomic information when forecasting future earnings using the full-sample of data and then compare this to results from industry-specific and time-specific subsamples. Additionally, we compare our model-based forecast's performance to those of the consensus analyst forecasts to complement our analysis. Finally, we discuss the conditions under which macroeconomic information is important.

Our study contributes to the current literature in three ways. First, we provide clear evidence of the direct, yet heterogeneous, impact of macroeconomic information on earnings forecast models when controlling for the role of firm-specific financial indicators. Second, our study shows that results from full-sample analyses that are commonly used in the literature may not be robust in explaining the role of earnings predictors. This means that it is important for researchers to consider time and industry effects in earnings forecast models. Third, our methodology of factor augmentation gives us the advantage of examining the impact of most available macroeconomic information instead of relying on several pre-selected macroeconomic variables.

The main findings of the study are summarised as follows. First, for the full sample, it is shown that macroeconomic variables should be incorporated into models that seek to predict firms' future earnings because such variables enhance predictive accuracy. Second, based on the Fama–MacBeth regression method, we find that for some of the industry-specific models not all macroeconomic variables are statistically significant. Third, further examination of the results gives us a clear picture of the heterogeneous impact of macroeconomic information on the earnings expectations of market participants over time and across industries. Fourth, we show that our model is generally more accurate for longer forecast horizons relative to analyst forecasts. Finally, we find that macroeconomic information is broadly important under the conditions of a volatile real economy, more diverse dividend policies, above-average accruals and increased asset growth.

The remainder of the paper is structured as follows. Section 2 reviews the literature. Section 3 describes the data and presents the descriptive summary statistics. Section 4 introduces the regression model and econometric methods. The empirical results are presented in Section 5, and further analysis is discussed in Section 6. Section 7 concludes the paper.

2. Literature review

In this section we briefly review existing literature that is most relevant to our study. Specifically, it includes literature on the relationship between macroeconomic information and expected earnings, and also literature pertaining to earnings forecasts.

2.1. Macroeconomic information and expected earnings

One strand of the accounting literature on expected earnings focuses on the forecasts of financial analysts, which are periodically issued for specific firms. There is mixed evidence suggesting that analysts take macroeconomic information into account when forming their earnings forecasts. Ackert and Hunter (1995) report that the forecast errors of analysts are uncorrelated with most macroeconomic data series. Because these series are significantly correlated with subsequently realised earnings, this implies that financial analysts process the relevant macroeconomic information when they forecast firm earnings. However, this finding does not hold when considering gross national product. Ackert and Hunter (1995) find that gross national product is seemingly not rationally considered by financial analysts in their forecasting. Conversely, Hussain (2007) suggests that both the composite leading index and the money supply seem to be potential elements within the information sets of security analysts. From another perspective, Hess and Kreutzmann (2010) provide evidence that unexpected macroeconomic news is captured when individual analysts revise their earnings forecasts, which implies that analysts use macroeconomic information when forecasting. In addition, Hussain (2010) finds that the brokerage house size affects the predictive ability of U.K. analysts, rationalising that large brokers have access to more resources, including their own macroeconomics or industry specialists, to support their forecasting activities.

The aforementioned works mainly focus on the impact of macroeconomic information on financial analyst forecasts. However, analyst forecasts are only relevant to a small sample of firms of strategic importance and/or high value, but we are more interested in earnings forecasts for all firms, including the smaller firms that are arguably more susceptible to episodes of economic change.

2.2. Earnings forecast models

Another strand of the literature focuses on earnings forecasts derived from statistical models that are usually either time-series or cross-sectional in nature.² Time series analyses, such as those using random walk or autoregressive moving average models (ARMA), generally only include current or past earnings information to predict future earnings. On the other hand, cross-

² Typical studies include those by Foster (1977), Ou and Penman (1989), O'Hanlon (1995) as well as Abarbanell and Bushee (1997).

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