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Master Thesis Financial Economics

Product market power and learning about future firm profitability

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Table of Contents

Abstract

My thesis examines how product market power affects analyst and investor learning about future firm profitability. Using a comprehensive sample of U.S. firms over the 1986–2015 period, I document that analysts' forecast accuracy is increasing in a firm's pricing power and decreasing in industry concentration, whereas the opposite conclusion holds for analyst forecast dispersion. This implies greater analyst learning for high pricing power firms and firms in fragmented industries. Moreover, I find that investors learn less from earnings announcements of high product market power firms while they respond more strongly to a given forecast error when product market power is greater. Further, pricing power has a greater influence on absolute earnings announcement returns following negative earnings surprises. This is potentially related to a larger positive bias in analysts' earnings forecasts for firms with less pricing power. The implications derived from the empirical evidence include that analysts' recommendations are more informative for high pricing power firms and firms in fragmented industries, which could lead to improved stock selection by investors.

Keywords: Product market power, Analysts' earnings forecasts, Earnings announcement returns, Analyst and investor learning

1. Introduction

Does product market power affect analyst and investor learning about future firm profitability? Previous research has established that analysts become more accurate in forecasting firm earnings over a firm's lifetime and that investor uncertainty regarding firm profitability diminishes after more earnings announcements have passed (see, e.g., Lang, 1991; Pastor and Veronesi, 2003). However, the influence of product market power on analyst and investor learning has received relatively little attention in the academic literature. Nonetheless, studies that examine product market power in relation to stock returns or firm-level variables generally find that competition substantially affects analysts' earnings forecasts and stock market returns (see, e.g., Datta, Iskandar-Datta, and Sharma, 2011; Bustamante and Donangelo, 2017).

Product market power affects earnings predictability and thereby analyst learning about firm profitability in multiple ways. Firms with more pricing power are better able to maintain profit margins when faced with exogenous cost shocks, leading to more stable earnings (Gaspar & Massa, 2006). Moreover, stronger industry concentration is related to a lower probability of new firms entering an industry and lower firm investments in innovation (Datta et al., 2011). Both effects are linked to improved earnings predictability. Next to that, product market power influences the extent to which firms disclose information to investors. Fear of competitive erosion can make it harder for analysts and investors to gather information on firms in an industry, thereby reducing earnings predictability. However, the empirical evidence on the direction of the latter effect is mixed (Hoberg & Phillips, 2010; Stivers, 2004; Verrecchia, 1983).

Information on firm profitability is made public through earnings announcements. Following these events, investors update their estimates of firm value and future profitability. Earnings announcements tend to be more informative to investors when uncertainty regarding future profitability is greater, as they learn more about a firm's average profitability (Yueng, 2009). In general, if actual earnings are larger than expected earnings, a positive earnings surprise, the firm's stock price tends to increase whereas the firm's stock price tends to decrease after a negative earnings surprise, when actual earnings are lower than expected. Peress (2010) finds that firms have more informative stock prices when product pricing power is greater, and that the impact of an earnings announcement on stock returns is smaller for high pricing power firms as a result. Alternatively, Imhoff and Lobo (1992) argue that if earnings are more predictable investors revise their earnings expectations more strongly in the direction of the earnings surprise.

This thesis complements previous studies by further examining the effect of product market power on analyst and investor learning about future firm profitability. The empirical analysis is split up into two parts. In the first part, I examine the impact of product market power on analysts' earnings forecast accuracy and analyst forecast dispersion. In the second part, I examine the relationship between product market power and stock returns around earnings announcements, also in relation to the sign of the earnings surprise. I also examine whether the impact of product market power on analyst and investor learning is constant over different sample periods.

The sample consists of U.S. firms from 1986 until 2015 for which quarterly earnings forecast data as well as product market power data is available. Data is obtained from the I/B/E/S database and the merged Compustat/CRSP database. Product market power is measured in two different ways; industry-adjusted pricing power and industry concentration. Industry-adjusted pricing power is a firm's price cost margin relative to other firms in the same industry, whereas industry concentration is a measure of the intensity of competition within an industry (Datta et al., 2011).

The literature that is most related to the first part of my thesis is Datta et al. (2011), who also investigate the link between competition on firms' product markets and analysts' forecast accuracy. I further examine this relationship and, in addition, focus on analyst forecast dispersion. Moreover, I employ a more reliable measure of industry concentration, which takes into account both public and private firms (Keil, 2017). Peress (2010), who examines the effect of market power on stock price informativeness, is most linked to the second part of my research. The novelties I introduce in this section include an examination of the relationship of both pricing power and industry concentration to earnings announcement returns, the interaction between the size of the forecast error and product market power as well as a potential asymmetric relationship between product market power, earnings announcement returns and the sign of the earnings surprise.

Empirically, I find that a firm's pricing power is valuable information for analysts when making earnings forecasts, as analyst learning about future firm profitability is greater for high pricing power firms due to more stable profit margins. On the other hand, I find that analysts learn more about future firm profitability when a firm operates in a more fragmented industry, feasibly because of an inferior information environment for firms in more concentrated industries. Moreover, investors learn less from earnings announcements of high product market power firms, as their absolute earnings announcement returns are lower. This is consistent with the notion that earnings announcements of high market power firms contain less information that is not already reflected in the stock price. In addition, investors attach more weight to a given forecast error if a firm has higher product market power, consistent with the information signal of an earnings surprise being stronger when earnings are more persistent. Furthermore, investors respond asymmetrically to negative and positive earnings surprises. Pricing power has a greater influence on absolute earnings announcement returns following negative earnings surprises, whereas investors respond more strongly to a given forecast error when both market power is greater and earnings are better than expected. This finding is possibly related to a larger positive bias in analysts' earnings forecasts for firms with less pricing power. Lastly, I find that the relationship between product market power and analysts' earnings forecasts has weakened over time, while the relationship between product market power and earnings announcement returns has strengthened.

This thesis contributes to the literature by presenting further evidence on the effect of product market power on analysts and investors learning about future firm profitability. The results will arguably be of interest to market practitioners, as they have the potential to lead to better analyst recommendations as well as improved stock selection by investors. Additionally, it indicates that extra stock and industry research efforts by analysts or investors offer the most potential for low pricing power firms and firms in concentrated industries.

The remainder of this thesis is organized as follows. Section 2 discusses literature related to learning about analysts and investors, analysts' earnings forecast, earnings announcement returns and product market power. Section 3 outlines and develops the hypotheses regarding the effect of product market power on analysts' earnings forecasts and earnings announcement returns. Section 4 describes the research design and provides a sample description. Section 5 discusses summary statistics. Section 6 presents the empirical results and discusses the findings. Section 7 concludes and discusses implications and limitations of the results.

2. Theoretical background

A crucial part of the job of a financial analyst is forecasting firms' profitability, as earnings forecasts provide important information to investors regarding firm valuation (Markov & Tamayo, 2006). However, often there is considerable uncertainty regarding future firm profitability. Uncertainty about future firm profitability is in general much greater for firms that do not have a long track record of earnings, firms with highly volatile profits or firms that pay no dividends than for mature, dividend-paying companies with a stable earnings stream (Pastor & Veronesi, 2003). Over time, as a firm has reported earnings more often, more earnings uncertainty is resolved, and analysts learn more about the average profitability of a firm. As a result, analysts' forecast errors and analyst disagreement tend to decrease over a firm's lifetime (Lang, 1991).

At the industry level, several effects have been documented to influence earnings predictability. First, firms with more market power are better able to withstand negative exogenous shocks to income, as they are likely to face less elastic demand (Gaspar & Massa, 2006). As a result, these firms can pass on more costs to customers and better maintain their profit margin. Hence, earnings of more monopolistic firms are more predictable. This effect is known as the natural hedge effect. From this effect it follows that analysts are expected to learn more about a firm's future profitability from its historical profitability if product market power is greater.

Second, in industries with larger barriers to entry, it is less likely that an entrant with a new, radical technology enters the market (Datta et al., 2011). Consequently, firms in industries with high entry barriers are better shielded from demand shocks and have more predictable earnings.

Third, Hou and Robinson (2006) find empirically that firms in concentrated industries invest less in innovation than firms in more competitive industries. The outcome of innovation activities is often highly uncertain, causing the effect on future earnings to be hard to quantify and competitive responses of rivals' complex to project (Datta et al., 2011). Hence, innovation activities make future earnings less predictable, which, in the aggregate, thus applies to firms in more concentrated industries.

Fourth, product market power influences information disclosure, which is positively related to earnings predictability, through several potential links (Ali, Klasa, & Yueng, 2014). On the one hand, Harris (1998) finds that managers are less likely to disclose information on business operations for segments in less competitive industries. He suggests that managers are incentivized to disclose less information in more monopolistic industries due to fear of competitive erosion of abnormal profits. Stivers (2004) also shows that information disclosure increases with competition. He theorizes that in more fragmented industries it becomes increasingly likely that at least one firm is of high enough quality to want to disclose proprietary information. This leads to a feedback loop where other firms in the industry also reveal their proprietary information to make their competitors look even worse. On the other hand, Verrecchia (1983) argues that firms in more competitive industries might be inclined to disclose less information, because disclosure provides valuable information to their competitors. Similarly, Hoberg and Phillips (2010) claim that information gathering is costlier in more fragmented industries, thereby leading market participants to rely on the same industry signals. Furthermore, they establish that investors and analysts fail to internalize the negative effect of competition on earnings in fragmented industries. Thus, the link between product market power and information disclosure has not yet been resolved.

Empirically, Datta et al. (2011), Gaspar and Massa (2006), and Haw, Hu and Lee (2015) find evidence that analysts' forecast errors and analyst forecast dispersion are significantly smaller for firms with more product market power. This evidence is thus consistent with the notion that earnings predictability is greater for more monopolistic firms. However, Ali, Klasa and Yueng (2014) find that industry concentration is positively associated with dispersion in analysts' earnings forecasts, analysts' forecast errors, and volatility of analyst forecast revisions, suggesting that firms in more concentrated industries have inferior information environments. Hence, the empirical evidence on the effect of product market power on analysts' forecasts is inconclusive.

Furthermore, Peress (2010) examines the effect of product market competition on stock price returns to earnings announcements. With a theoretical model he establishes that firms with greater pricing power have more informative stock prices, because more private information of investors is incorporated into their prices due to greater stock liquidity. When stock prices of firms facing less competition are more informative, the informational content of an earnings announcement and the corresponding stock price reaction is predicted to be lower. Empirically, Peress (2010) confirms this prediction and finds that firms with more pricing power experience a smaller stock price response following an earnings surprise. Similarly, Lang (1991) finds that the stock price response to a given earnings surprise increases with uncertainty about future earnings, as investors put more weight on current-period earnings for firms that have more uncertain future earnings.

In contrast, Imhoff and Lobo (1992) establish that firms facing high (low) uncertainty prior to an earnings announcement have stock price responses that are smaller (greater) in magnitude for a given earnings surprise. They argue that if earnings are more predictable, investors revise their earnings expectations upwards (downwards) more strongly following a positive (negative) earnings surprise. That is, investors put more weight on an earnings surprise if their ex-ante earnings uncertainty is lower because the firm's earnings are expected to be more persistent. Hence, the link between earnings surprises, earnings announcement returns and the relationship with product market power is inconclusive.

3. Hypothesis development

3.1 Analysts' earnings forecasts

When future profits are more closely related to historical profits the complexity of forecasting earnings is lower and both analysts' earnings forecast errors and analyst dispersion are expected to be smaller. The natural hedge effect, entry barriers, and innovation risk all suggest a positive relationship between product market power and earnings predictability, while the relationship between the degree of information disclosure, product market power, and earnings predictability is more ambiguous. Overall, these effects imply that analysts learn more from historical earnings of firms with high pricing power and of firms operating in concentrated industries. Therefore, I expect that analysts' earnings forecasts are more accurate for firms with more product market power and that the level of disagreement among analysts on expected earnings per share is smaller if a firm's market power is greater. This leads to hypotheses 1 and 2:

Hypothesis 1: Analysts' forecast errors are smaller for firms with more product market power

Hypothesis 2: Analyst disagreement is smaller for firms with more product market power

3.2 Earnings announcement returns

The relationship between product market competition and stock price returns in response to earnings announcements is an empirical matter. Peress (2010) finds that firms with more market power experience smaller absolute stock price responses around earnings announcement. He argues that this finding results from more private information of investors already being incorporated into stock prices, leading to a less informative earnings announcement. However, Peress (2010) does not examine whether ex-ante earnings uncertainty impacts the stock price response. Lang (1991) finds that stock price responses are increasing in ex-ante uncertainty about future earnings, as investors put more weight on current period earnings. On the contrary, Imhoff and Lobo (1992) establish that the size of earnings announcement returns are decreasing in investor uncertainty about future firm profitability, arguing that investors place greater weight on earnings surprises when earnings uncertainty is lower because earnings are expected to be more persistent. To the extent that future earnings uncertainty and stock price informativeness are dependent on product market power, I expect earnings announcement returns to be influenced by product market power. From the above arguments follows hypothesis 3:

Hypothesis 3: Absolute earnings announcement returns are dependent on product market power

Furthermore, Skinner and Sloan (2002) document an asymmetric response to earnings surprises, with investors reacting more strongly to negative earnings surprises of high growth firms than to negative earnings surprises of low growth firms, regardless of the size of the forecast error. I examine whether, dependent on the competitive environment of a firm, investors react asymmetrically to positive and negative earnings surprises. An asymmetric stock price response to the sign of the earnings surprise in connection with product market power implies that investors learn different things from positive and negative earnings surprises. For example, Datta et al. (2011) establish that analysts' earnings forecasts are more positively biased for firms with less product market power. As a result, investors could potentially weigh negative earnings surprises of firms facing more product market competition less strongly. From the above reasoning follows hypothesis 4:

Hypothesis 4: Stock price returns to earnings surprises are dependent on product market power and the sign of the earnings surprise

4. Research design

4.1 Sample formation

The initial sample includes all U.S. firms that are both in the Institutional Brokers' Estimate System (I/B/E/S) Summary History file and the merged Compustat/CRSP database with share codes 10 and 11 from January 1986 to December 2015. From the I/B/E/S database I obtain data on earnings-per-share (EPS) forecasts, actual EPS, and earnings announcement dates. I include only the last earnings forecast estimate before the end of the fiscal quarter, and exclude observations where earnings are announced more than 90 days after quarter-end. Moreover, at least two analysts must have issued an earnings forecast for the quarter, following Datta et al. (2011). From Compustat/CRSP Fundamentals Quarterly I obtain data on accounting variables and from Compustat/CRSP Security Daily I obtain data on stock returns. Consistent with prior literature firms in the utility industry (SIC codes 4810-4819, 4910-4919, and 4941-4949) and financial firms (SIC codes 6000-6999) are excluded from the sample, as regulations have a much bigger impact on firms in these industries. Moreover, I exclude observations with missing data on the market power measures and require at least three firms in a 2-digit SIC code industry, similar to Gaspar and Massa (2006) and Peress (2010). Lastly, I require all firms to have minimum quarterly sales, assets, and market capitalization of $1 million, to mitigate extreme effects of the smallest firms. All continuous variables are winsorized at the 1/99%-level. The resulting sample contains 7,652 firms for a total of 197,827 firm-quarter observations with an average of approximately 26 quarters of data for each firm.

4.2 Measuring product market power variables

Analogous to the literature on industrial organization, I measure product market power in two different ways; pricing power and industry concentration. Pricing power captures the ability of firms to maintain their profit margin and absorb exogenous cost shocks by passing costs on to customers, relative to other firms in the same industry. On the other hand, industry concentration measures the intensity of competition within an industry (Datta et al., 2011). As such, pricing power captures intra-industry market power, whereas industry concentration measures market power at aggregate level.

Pricing power is measured by the Lerner Index, following the approach of, among others, Gaspar and Massa (2006). The Lerner Index is also known as the price-cost margin (PCM), and is computed in the following way:

$$Lerner\ Index_{it} \ = \ PCM_{it} = \frac{Sales_{it} - COGS_{it} - SG\&A_{it}}{Sales_{it}} \tag{1}$$

where *Sales* equals firm sales in quarter *t*, cost of goods sold is given by *COGS*, and *SG&A* are selling, general and administrative expenses for a firm in quarter *t*. If data is missing for the above items, I use operating income divided by sales to calculate the price-cost margin.

The PCM measures the ability of a firm to pass on costs to customers, however, industry-wide factors that are unrelated to the firm's pricing power also affect the PCM. The PCM therefore does not give an accurate description of a firm's competitive position within an industry (Gaspar & Massa, 2006). Moreover, different industries can have different profit margins due to structural factors that are unrelated to the market power of firms. To isolate firm-specific factors related to product market power within an industry that influence the price-cost margin, I use the industry-adjusted Lerner Index, following Gaspar and Massa (2006) and Datta et al. (2011). The industry-adjusted Lerner Index, or excess price-cost margin (EPCM), is calculated as the firm's price-cost margin minus the average price-cost margin in the firm's industry:

$$Adj. Lerner\ Index_{it} \ = EPCM_{it} = PCM_{it} - \sum_{i=1}^{N} \omega_{it} PCM_{it} \tag{2}$$

where *PCM* is the price-cost margin of firm *i* in quarter *t* as calculated in equation (1), ω_{it} gives the proportion of sales of firm *i* to total industry sales in quarter *t*, and *N* is the total number of firms in the two-digit SIC code industry. The full set of firms in the Compustat/CRSP database is used to calculate the industry-adjusted Lerner Index. The industry-adjusted Lerner Index serves as the measure for pricing power of a firm in the remainder of the paper and is computed at the end of each fiscal quarter for every firm.

Industry concentration is commonly estimated in the literature by the sales-based Herfindahl-Hirschman index (HHI) and generally affects the price-setting ability of a firm (Gaspar & Massa, 2006). The HHI index is given by the sum of squared market shares, based on firm sales, in an industry:

$$Herfindahl\ Index\ = HHI_{jt} \equiv \sum_{i=1}^{N} \left(\frac{Sales_{it}}{\sum_{i=1}^{N} Sales_{it}} \right) \tag{3}$$

where *N* is the number of firms in industry *j* in year *t*, *Sales* equals sales of firm *i* in quarter *t*. A higher Herfindahl index indicates greater industry concentration.

Studies by Ali, Klasa, and Yueng (2009) and Keil (2017) show that concentration ratios from the U.S. Economic Census which include both publicly listed and private firms are much more reliable than Compustat data. However, a drawback of using Census data is that it is only available in five-year intervals. Keil (2017) has made use of fitted regressions to obtain annual estimates of the HHI by industry in years for which there is no Census data available. These estimates are based on variables (the number of companies, establishments, employees, payroll bills, and sales) from the U.S. Census, the Bureau of Labor Statistics' Quarterly Census of Employment and Wages as well as the Compustat company level HHI. More details regarding the procedure are provided in Keil (2017). Keil has made data on the fitted HHI per industry from 1975 until 2015 available on his website.[1] I use this data as the main measure of industry concentration.

4.3 Measuring analysts' earnings forecasts variables

Similar to the literature on analysts' earnings forecasts, I compute analysts' forecast accuracy by taking the negative of the absolute difference between consensus (median) forecasted EPS and actual EPS for firm *i* in quarter *t*, scaled by stock price on the trading day preceding the forecast date:

$$Forecast\ Accuracy_{it} = -\frac{\left| EPS_{it}^{Forecast} - EPS_{it}^{Actual} \right|}{P_{it-1}}, \tag{4}$$

[1] https://sites.google.com/site/drjankeil/data

The forecast accuracy measure increases if forecast errors are smaller due to the multiplication of the absolute value of the difference between consensus and actual EPS by minus 1.

Analyst disagreement, or analyst forecast dispersion, is computed by dividing the standard deviation of all analysts' earnings forecasts for firm *i* in quarter *t* by the stock price on the trading day preceding the forecast date, using the definition of Haw et al. (2015):

$$Dispersion_{it} = \frac{StandardDeviation(EPS_{it}^{Forecast})}{P_{it-1}}, \tag{5}$$

4.4 Measuring earnings announcement returns

In measuring the stock price reaction to an earnings surprise, I follow a method similar to Peress (2010). I apply absolute abnormal stock returns over a 5-day event window around earnings announcements, from t = -2 to t = 2, as the main measure of stock price responses to earnings announcements. Using a 5-day interval limits the effect of noise on the returns, while allowing for the news conveyed in the earnings announcement to be incorporated in the stock price as well as for some margin of error in the reported earnings announcement date. Nevertheless, the 5-day interval remains an arbitrary window. Therefore, I apply robustness checks with 3-, 11-, and 21-day event windows.

Abnormal returns are computed by subtracting a firm's expected stock return based on historical data from its actual stock return over the event window. Actual (raw) stock returns are calculated as buy-and-hold with-dividend stock returns. Expected stock returns are computed based on the Fama-French (1993) three-factor model. For every firm observation over a window of 245 trading days, from t = -250 until t = -5, with a minimum of 200 trading days for each estimate, the average Small-minus-Big (SMB), High-minus-Low (HML) and excess market return (Rm – Rf) factor loadings are estimated. Market data on the factor returns comes from Kenneth French's website[2]. The factor loadings are subsequently multiplied by the factor return on a trading day within the event window for every firm-estimate. Finally, I take the absolute value of the abnormal stock return over the event window to examine whether investor responses to earnings announcement are dependent on product market power. Taking absolute returns ensures that the direction of the stock price return does not influence results.

[2] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/

4.5 Regression specifications

To test hypothesis 1 and 2 and examine the relationship between product market power and analysts' earnings forecasts, I regress product market power, defined as either the Lerner Index or Herfindahl Index, on analysts' forecast accuracy and analyst forecast dispersion. It has been documented in the literature that analysts' forecast errors and analyst forecast dispersion tend to be larger for firms with more earnings uncertainty, regardless of the level of product market power. Therefore, I also include control variables that have been identified to play a significant role in explaining analysts' forecasts accuracy. The full model has the following specification, which I run in different forms with the dependent variable being either analysts' forecast accuracy or analyst forecast dispersion:

$$Analyst_{i,t} = \beta_0 + \beta_1 MarketPower_{i,t} + \beta_2 Size_{i,t} + \beta_3 Coverage_{i,t} + \beta_4 Leverage_{i,t} + \beta_5 Turnover_{i,t} + \beta_6 Volatility_{i,t} + \beta_7 Age_{i,t} + \varepsilon_{i,t} \tag{6}$$

Size, defined as the natural logarithm of the firm's market capitalization on the last day of the previous fiscal quarter, is included as a proxy for multiple factors relating to analyst's forecasts, including information availability. Information availability for large firms is expected to be larger than that of small firms due to lower relative disclosure costs and from investor attention. Therefore, earnings forecast accuracy is likely to be bigger for larger firms (e.g., Lang and Lundholm, 1996; Zhang, 2006; Haw et al., 2015). Lys and Soo (1995) find that analyst accuracy increases with the number of analysts following a particular firm. Reasons offered for this finding include that analysts put in more effort to gather information when faced with more competition of other analysts, while they also can learn from earnings forecasts of other analysts. Hence, greater competition among analysts is expected to lead to more accurate forecasts. Therefore, I include *Coverage*, defined as the logarithm of the number of analysts providing an earnings forecasts for a firm in a quarter, as a control variable in the regression. Furthermore, Hope (2004) finds that leverage is negatively associated with analyst forecast accuracy, as firms with more leverage are likely to have more variable earnings. Hence, I include a control variable for *leverage*, defined as total long-term debt over total assets in the regression. Peress (2010) argues that firms with higher stock turnover have more informative stock prices. This implies that high turnover stocks have less informational uncertainty, meaning that earnings predictability is expected to be higher. *Turnover* is measured by the natural logarithm of the dollar volume of shares traded during the quarter divided by common shares outstanding at the end of the quarter. *Volatility* is measured as the standard deviation of the quarterly return on equity over the preceding three years. Higher volatility implies more variable earnings which increases the complexity for analyst to estimate earnings (Datta et al., 2011). The inclusion of the volatility of profitability variable is expected to reduce the impact of pricing power on forecast accuracy, as firms with more market power are also hypothesized to have lower historical volatility of profitability. Furthermore, Pastor and Veronesi (2003) establish that market participants learn over time of the average profitability of a firm. As a result, analysts are expected to be more accurate in forecasting earnings for firms with a longer track record of earnings. Hence, *Age*, defined as the natural logarithm of one plus the number of years that a firm has been listed on CRSP, is included in the regression. Note that the number of years a firm has been listed on CRSP is an imperfect proxy for a firm's length of existence. Besides, firm age is likely to be correlated with product market competition. Competition tends to be fiercer when there are many young firms in a new industry who compete on market share. Over time only the firms which successfully do so remain, implying a positive relationship between industry concentration and firm age. Thus, the inclusion of firm age is likely to reduce the influence of industry concentration on forecast accuracy.

Note that the variables included in the model are proxies for 'true' effects. It is conceivable that these factors do not capture their full influence on product market power and analysts' earnings forecasts as intended. Moreover, if there is an omitted variable that affects both analysts' earnings forecasts and product market power then that could lead to biased outcomes. Besides, it is likely that the sample suffers from sample selection bias. Only publicly listed firms are included in the sample and these firms are not likely to be random selection of all firms. Chemmanur, He and Nandy (2009) find that firms operating in competitive industries with more information asymmetries are less likely to do an initial public offering. As such, results should be interpreted with reasonable care.

Sample observations across firms in one quarter are likely to be correlated, for example due to a general business cycle effect or an exogenous shock that affects all firms. Therefore, I include time fixed effects in model (6). Moreover, residuals of firms within an industry are likely to be correlated with each other but to a lesser extent with residuals of firms in other industries. Hence, I also include industry fixed effects to account for within industry differences. Furthermore, standard errors are clustered by company to account for residuals of a given firm that may be correlated over time. Controlling for time, industry and firm-specific effects in model (6) ensures that standard errors are unbiased and normally distributed, that is, exhibit homoscedasticity and no serial correlation. This regression specification follows the suggested approach of Petersen (2009). As a robustness check I also apply Fama-MacBeth (1973) regressions.

To test hypothesis 3 and examine the relationship between product market competition and quarterly earnings announcement returns, I regress the Lerner Index and Herfindahl Index on abnormal absolute stock returns over a five-day announcement period interval. I include absolute analysts' forecast errors, the interaction effect between analysts' forecast errors and product market power, and analyst forecast dispersion as control variables, as well as the same control variables that are included in model (6).

Absolute stock price responses to earnings announcements are expected to be increasing in analyst forecast errors. Larger forecast errors indicate that the surprise in the announcement is greater and more information is conveyed to investors, which is therefore expected to lead to greater adjustments of estimates of firm value. Analyst forecast dispersion is included as a proxy for ex ante earnings uncertainty and noise in earnings forecasts (Imhoff & Lobo, 1992). A positive relationship between forecast dispersion and absolute announcement returns is expected as Lang (1991) finds that ex-ante earnings uncertainty is linked to stronger stock price responses. Firm size is expected to be negatively related to earnings announcement returns due to a superior information environment of larger firms. The direction of the effect of analyst coverage on absolute announcement returns is expected to be negative as investor sophistication is expected to be greater in stocks that are covered by more analysts (Mendenhall, 2004). Leverage is expected to be positively related to absolute announcement returns as firms with higher leverage are riskier, implying greater earnings uncertainty (Peress, 2010). Stock turnover is expected to have a negative relationship with absolute earnings announcement returns as more private information is reflected in the stock price of shares with larger trading volume (Peress, 2010). Historical volatility of profitability is expected to lead to greater absolute announcement returns as investors put more weight on current period earnings if they are more uncertain about average profitability of firms (Lang, 1991). Similar to the analysis on analysts' earnings, note that the control variables included in the model are proxies for the 'true' effects and there could potentially be omitted variables that influence both earnings announcement returns and product market power as well as sample selection bias. If that is the case, results are biased. As such, outcomes should be treated with reasonable care.

Moreover, I include an interaction effect between market power, which proxies for the Lerner or Herfindahl Index respectively, and absolute analysts' forecast errors in the regression to examine whether the effect of product market competition on earnings announcement returns is influenced by the size of the forecast error. Again, quarter and industry fixed effects are included in the model and I correct standard errors for firm-level clustering to ensure that standard errors are robust and exhibit homoscedasticity and no serial correlation. The full regression has the following specification which I run in multiple forms:

$$\begin{aligned} R_{i,t} = \alpha + \beta_1 MarketPower_{i,t} + \beta_2 MarketPower \times ForecastError_{i,t} + \\ \beta_3 ForecastError_{i,t} + \beta_4 Dispersion_{i,t} + \beta_5 Size_{it} + \beta_6 Coverage_{it} + \\ \beta_7 Leverage_{it} + \beta_8 Turnover_{it} + \beta_9 Volatility_{it} + \beta_{10} Age_{it} + \varepsilon_{i,t} \end{aligned} \quad (7)$$

In addition, to test hypothesis 4, I include dummy variables for the sign of the earnings surprise in model (7). This allows for analyzing a potential asymmetrical relationship between quarterly earnings announcement returns and product market power, for positive and negative earnings surprises respectively.

5. Data

5.1 Summary statistics

Table 1 reports summary statistics for the full sample. Panel A presents the mean, median, standard deviation, minimum, maximum, and number of observations of the main variables which are used in the analysis. All continuous variables are winsorized at the 1% and 99% level to reduce the effect of outliers.

The total sample consists of 7,652 firms for a total of 197,827 observations. A firm is on average in the sample for approximately 26 quarters with the median being 16 quarters. Mean market capitalization is $3.9 billion, ranging from $1.1 million to $764 billion. Sample firms have mean leverage of 18.57%, and the average firm has been listed on the stock exchange for almost 18 years. The mean of the natural logarithm of quarterly stock turnover and historical volatility of profitability are 1.70% and 0.08% respectively.

The summary statistics for the market power measures are provided in panel B of table 1. Mean (median) Lerner Index is 5.20% (12.64%), whereas the industry-adjusted Lerner Index has a mean (median) of -9.17% (-0.31%). This implies that, within a given industry, firms with larger sales tend to have greater price-cost margins than smaller firms. The Herfindahl Index has a mean of

Table 1

Descriptive statistics. This table reports summary statistics for the main sample variables. Statistics are based on 197,827 observations drawn from the intersection of the I/B/E/S and COMPUSTAT/CRSP-merged databases over the period Jan 1986 - Dec 2015. Sample includes U.S. firms listed on the NYSE, Nasdaq or AMEX stock exchange and excludes utilities and financial firms. *Size* is a firm's market capitalization in millions of USD in the quarter before the earnings announcement. *Leverage* is total long-term debt divided by total assets, weighted by firm total assets. *Turnover* is defined as the natural logarithm of the dollar volume of shares traded divided by the number of shares outstanding in the quarter. *Volatility* is the natural logarithm of historical volatility of profitability, measured as one plus the standard deviation of quarterly return on equity over the preceding three years. *Age* is the number of years a firm has been listed on CRSP. *Lerner Index* is measured as the price-cost margin, defined as sales minus cost of goods sold and selling, general and administrative expenses divided by sales. *Industry-adjusted Lerner Index* is constructed as the difference between the firm's Lerner Index and the average Lerner Index in the two-digit SIC industry. *Herfindahl Index* is the squared sum of market share of firm sales within a SIC/NAICS industry. *Herfindahl Index Census* is the Herfindahl Index as calculated by the U.S. Census in Census years. *Forecast accuracy* is the negative of the absolute difference between analyst consensus quarterly EPS forecast and the firm's actual quarterly EPS, standardized by the stock price on the trading day preceding the forecast date. *Forecast dispersion* is measured as the standard deviation of all earnings forecasts for a firm in a quarter divided by the stock price on the trading day preceding the forecast date. *Analyst coverage* is the number of analysts covering a firm in a quarter. *5-day raw return* is a firm's earnings announcement stock return over an event window from t = -2 to t = 2. *5-day abnormal return* is the difference between the expected stock return of a firm over the 5-day period around an earnings announcement, based on the residuals of the Fama-French three-factor model over an estimation window from t = -250 until t = -5, and the 5-day raw stock return. *5-day raw absolute return* is the absolute of the 5-day raw return. *5-day abnormal absolute return* is the absolute of the 5-day abnormal return. All continuous variables are winsorized at the 1/99% level.

Variable	Mean	Median	Std. Dev.	Min	Max	*N*
Panel A: Firm characteristics						
Number of quarters per firm	25.85	16.00	26.75	1.00	120.00	7,652
Size	3,905.44	627.36	17,080.94	1.09	764,366.13	197,827
Leverage (%)	18.57	14.77	18.70	0.00	81.62	195,585
Turnover	1.70	1.75	1.43	-1.83	5.12	188,333
Volatility	0.08	0.03	0.18	0.00	1.26	168,076
Age	17.92	12.00	17.31	1.00	91.00	197,827
Panel B: Market power measure						
Lerner Index (%)	5.20	12.64	49.57	-340.56	66.00	197,827
Industry-adjusted Lerner Index (%)	-9.17	-0.31	49.79	-357.83	42.98	197,827
Herfindahl Index (%)	6.23	5.40	2.81	4.44	68.83	197,827
Herfindahl Index Census (%)	6.07	5.00	5.37	0.00	39.36	32,158
Panel C: Analysts' forecast characteristics						
Forecast accuracy (%)	-0.61	-0.18	1.40	-10.14	0.00	197,827
Forecast dispersion (%)	0.27	0.10	0.53	0.00	3.68	197,827
Analyst coverage	7.39	5.00	5.91	2.00	50.00	197,827
Panel D: Earnings announcement returns						
5-day raw return (%)	0.40	0.13	9.82	-28.95	31.57	197,795
5-day abnormal return (%)	0.09	-0.09	9.72	-28.79	31.05	190,952
5-day raw absolute return (%)	7.08	4.95	6.82	0.00	31.57	197,795
5-day abnormal absolute return (%)	7.01	4.90	6.73	0.00	31.05	190,952

6.23% and ranges from 4.44% to 68.83%, which is similar to the mean and median Herfindahl Index as provided by the U.S. Census in Census years.

Panel C presents summary statistics of analysts' forecasts characteristics. Mean (median) quarterly forecast accuracy is equal to -0.61% (-0.18%). Forecast dispersion has an average (median) value of 0.27 (0.10%). In addition, a firm is on average covered by 7.39 analysts, with the median being 5 analysts.

Earnings announcement returns are presented in panel D of table 1. Mean raw 5-day returns surrounding earnings announcements are 0.40%. 5-day abnormal announcement returns are on average slightly positive at 0.09% but negative for the median firm with -0.09%. This implies that, in the cross-section, investors respond almost neutrally to earnings announcements, which is expected in an efficient market. Mean 5-day absolute raw and abnormal returns are 7.08% and 7.01% respectively, indicating that information conveyed in earnings announcements leads to substantial revisions of firm valuations.

5.2 Summary statistics by product market power quintile

Table 2 provides summary statistics of the main variables by product market power quintile. Panel A presents the mean and median of analysts' forecast characteristics, earnings announcement returns and firm-level characteristics by Lerner Index quintile. Both mean and median forecast accuracy are increasing in the Lerner Index quintiles, except between quintile 4 and 5 where they change little. Although other findings are not yet controlled for, this suggests that it is easier for analysts to forecast quarterly earnings of firms that have more product pricing power. Analyst forecast dispersion is highest for firms in quintile 1 and lowest for firms in quintile 4 and 5.

Abnormal five-day announcement returns are negative on average in quintile 1 and increasing in the other quintiles, although not monotonically. This provides suggestive evidence for investors being too optimistic in their valuations for firm with less pricing power and that they adjust their estimates accordingly when firm earnings are announced. Absolute abnormal five-day announcement returns are highest in quintile 1 at 8.07%, decrease to 6.49% in quintile 4, but increase to 6.68% in quintile 5. Moreover, mean and median firm size and analyst coverage are increasing in the Lerner Index, indicating that firms with high product pricing power tend to be larger and have more analysts following them. Leverage is lowest for firms in quintile 1. Stock turnover increases monotonically in the quintiles. Volatility of profitability is highest for firms facing the most product pricing competition, while it is lower for firms with more pricing power, consistent with high pricing power firms having more stable profit margins. The youngest firms are found in quintile 1, whereas the oldest firms are in the middle quintiles. One reason for why firms in quintile 5 might be younger and have similar volatility of profitability compared to firms in lower quintiles could be that these firms are more likely to have disrupted their industry and as a result have high pricing power but volatile historical profits.

Panel B of table 2 presents the summary statistics of the main variables by Herfindahl Index quintile. Forecast accuracy is lowest for firms in the bottom quintile, that is, less concentrated industries, but the difference between the different concentration quintiles is small. Similarly, little separates the different quintiles for analyst forecast dispersion. Thus, there is no clear indication based on summary statistics that industry concentration influences analysts' forecasts. This is likely due to many other confounding factors, such as a firm's information environment playing a dominant role in explaining analysts' forecast errors in relation to industry concentration. Abnormal announcement returns are highest in the top two quintiles, with absolute abnormal announcement returns being largest and smallest in quintile 1 and 5. Firm size, analyst coverage, leverage, quarterly stock turnover and firm age are largest, whereas volatility of profitability is smallest in the most concentrated industries.

5.3 Correlation matrix

In table 3 the Pearson correlation coefficients between the main variables are presented. The first thing to note is that the Lerner Index and Herfindahl Index have a correlation of only 0.06. This indicates that both measures capture different aspects of product market power, namely intra-industry product pricing power and the aggregate level of competition within industries. As expected, the correlation between analyst forecast accuracy and both the Lerner Index and Herfindahl Index is significantly positive, while the correlation between forecast dispersion and the product market power variables is significantly negative. In both instances, the correlations are much stronger for the Lerner Index. The correlation between the product market power measures and 5-day abnormal absolute announcement returns is negative, indicating that announcement returns tend to be less extreme for more monopolistic firms. Furthermore, both product market power measures have a significant positive correlation with firm size, analyst coverage, leverage, quarterly stock turnover and firm age while they are negatively correlated with volatility of profitability. The latter correlation indicates that firms with more product market power are indeed less likely to experience severe swings in profits, although the correlation is much stronger for pricing power than for industry concentration. This finding is consistent with the explanation of firms with more pricing power being able to pass cost shocks on to consumers and shield their profits from exogenous shocks. Analyst dispersion is highly negatively correlated with analyst forecast accuracy, which indicates that when analysts disagree more they are also more likely to make larger forecast errors. Furthermore, analysts tend to be more accurate and disagree less for larger, low leverage, high stock turnover, low earnings volatility and older firms, which are covered by more analysts. These correlations are in line with the analysts' forecast literature.

Table 2

Descriptive statistics by product market power. Panel A reports summary statistics of the main sample variables based on industry-adjusted Lerner Index quintiles. Panel B reports summary statistics of the main sample variables based on Herfindahl Index quintiles. The first (last) quintile represents firms with the least (most) product market power. *Forecast accuracy* is the negative of the absolute difference between analyst consensus quarterly EPS forecast and the firm's actual quarterly EPS, standardized by the stock price on the trading day preceding the forecast date. *Forecast dispersion* is measured as the standard deviation of all earnings forecasts for a firm in a quarter divided by the stock price on the trading day preceding the forecast date. *5-day abnormal return* is the difference between the expected stock return of a firm over the 5-day period around an earnings announcement, based on the residuals of the Fama-French three-factor model over an estimation window from t = -250 until t = -5, and the 5-day raw stock return. *5-day abnormal abs. return* is the absolute of the 5-day abnormal return. *Size* is a firm's market capitalization in millions of USD in the quarter before the earnings announcement. *Analyst coverage* is the number of analysts covering a firm in a quarter. *Leverage* is computed as total long-term debt divided by total assets, weighted by firm total assets. *Turnover* is defined as the natural logarithm of the dollar volume of shares traded divided by the number of shares outstanding in the previous quarter. *Volatility* is the natural logarithm of historical volatility of profitability, measured as one plus the standard deviation of quarterly return on equity over the preceding three years. *Age* is the number of years a firm has been listed on CRSP. All continuous variables are winsorized at the 1/99% level.

Variable	Forecast accuracy (%)	Forecast dispersion (%)	5-day abnormal return (%)	5-day abnormal abs. return (%)	Size	Analyst coverage	Leverage (%)	Turnover	Volatility	Age
Panel A: Quintiles based on industry-adjusted Lerner Index										
Quintile 1	-1.31	0.54	-1.28	8.07	1,068.14	5.50	14.78	1.36	0.13	13.18
	(-0.45)	(0.24)	(-1.12)	(5.68)	(254.60)	(4.00)	(5.75)	(1.30)	(0.05)	(8.00)
Quintile 2	-0.64	0.29	0.01	7.19	2,044.73	6.56	18.27	1.50	0.07	18.71
	(-0.22)	(0.12)	(-0.19)	(5.03)	(469.99)	(5.00)	(15.65)	(1.54)	(0.03)	(13.00)
Quintile 3	-0.42	0.20	0.51	6.64	3,804.77	7.45	19.95	1.71	0.06	20.52
	(-0.15)	(0.09)	(0.20)	(4.65)	(746.77)	(6.00)	(17.65)	(1.78)	(0.02)	(15.00)
Quintile 4	-0.33	0.16	0.61	6.49	5,050.45	8.21	20.03	1.88	0.06	20.14
	(-0.12)	(0.07)	(0.28)	(4.54)	(1005.86)	(6.00)	(17.27)	(1.98)	(0.02)	(14.00)
Quintile 5	-0.35	0.17	0.55	6.68	7,567.22	9.21	19.77	2.06	0.07	17.06
	(-0.11)	(0.07)	(0.24)	(4.72)	(1,158.50)	(7.00)	(14.85)	(2.17)	(0.02)	(12.00)
Panel B: Quintiles based on Herfindahl Index										
Quintile 1	-0.69	0.30	-0.04	7.58	2,946.40	7.07	21.50	1.68	0.08	13.76
	(-0.20)	(0.12)	(-0.24)	(5.31)	(445.61)	(5.00)	(19.11)	(1.72)	(0.03)	(9.00)
Quintile 2	-0.60	0.27	0.01	7.06	2,199.53	6.75	21.23	1.67	0.08	15.99
	(-0.17)	(0.10)	(-0.17)	(4.98)	(529.57)	(5.00)	(18.88)	(1.70)	(0.03)	(11.00)
Quintile 3	-0.55	0.25	0.07	7.12	3,988.71	7.27	19.47	1.70	0.09	16.29
	(-0.16)	(0.09)	(-0.11)	(5.00)	(592.85)	(5.00)	(17.28)	(1.74)	(0.03)	(12.00)
Quintile 4	-0.61	0.25	0.19	6.96	3,750.48	7.41	20.87	1.67	0.07	18.89
	(-0.17)	(0.10)	(-0.01)	(4.89)	(686.07)	(5.00)	(18.51)	(1.70)	(0.03)	(14.00)
Quintile 5	-0.60	0.27	0.20	6.33	6,733.28	8.46	23.25	1.80	0.06	24.87
	(-0.17)	(0.11)	(0.06)	(4.42)	(1,094.62)	(7.00)	(21.81)	(1.88)	(0.03)	(18.00)

Table 3

Pearson correlation matrix. Pearson correlations between the main sample variables. *Lerner Index* is constructed as the difference between the firm's Lerner Index and the average Lerner Index of the two-digit SIC industry. *Herfindahl Index* is the squared sum of market share of firm sales within a SIC/NAICS industry. *Forecast accuracy* is the negative of the absolute difference between analyst consensus quarterly EPS forecast and the firm's actual quarterly EPS, standardized by the stock price on the trading day preceding the forecast date. *Forecast dispersion* is measured as the standard deviation of all earnings forecasts for a firm in a quarter divided by the stock price on the trading day preceding the forecast date. *5-day abnormal return* is the difference between the expected stock return of a firm over the 5-day period around an earnings announcement, based on the residuals of the Fama-French three-factor model over an estimation window from t = -250 until t = -5, and the 5-day raw stock return. *5-day abnormal abs. return* is the absolute of the 5-day abnormal return. *Size* is the nautral logarithm of a firm's market capitalization in millions of USD in the quarter before the earnings announcement. *Analyst coverage* is the number of analysts covering a firm in a quarter. *Leverage* is computed as the total long-term debt divided by total assets, weighted by firm total assets. *Turnover* is defined as the natural logarithm of the dollar volume of shares traded divided by the number of shares outstanding in the quarter. *Volatility* the natural logarithm of historical volatility of profitability, measured as one plus the standard deviation of quarterly return on equity over the preceding three years. *Age* is the natural logarithm of one plus number of years a firm has been listed on CRSP. Correlations significant at the 1% level are in bold. Significance levels based on two-tailed t-tests.

Variables	Lerner Index	Herfindahl Index	Forecast accuracy	Forecast dispersion	5-day abnormal return	5-day abnormal abs. return	Size	Coverage	Leverage	Turnover	Volatility	Age
Lerner Index	1.00	**0.06**	**0.17**	**-0.24**	**0.06**	**-0.09**	**0.18**	**0.10**	**0.06**	**0.02**	**-0.21**	**0.14**
Herfindahl Index		1.00	**0.02**	**-0.02**	0.01	**-0.05**	**0.19**	**0.14**	**0.08**	**0.06**	**-0.02**	**0.17**
Forecast accuracy			1.00	**-0.60**	**0.01**	**-0.15**	**0.31**	**0.17**	**-0.10**	**0.18**	**-0.14**	**0.06**
Forecast dispersion				1.00	0.00	**0.13**	**-0.30**	**-0.15**	**0.14**	**-0.19**	**0.19**	**-0.05**
5-day abnormal return					1.00	**0.05**	**0.02**	**0.01**	0.00	**-0.05**	**-0.03**	**0.01**
5-day abnormal abs. return						1.00	**-0.18**	**-0.04**	**-0.06**	**0.06**	**0.07**	**-0.17**
Size							1.00	**0.72**	**0.09**	**0.49**	**-0.07**	**0.43**
Analyst coverage								1.00	**0.06**	**0.47**	**-0.03**	**0.26**
Leverage									1.00	**-0.03**	**0.20**	**0.09**
Turnover										1.00	**0.02**	**0.09**
Volatility											1.00	**-0.07**
Age												1.00

6. Empirical results

6.1 Analysts' forecast accuracy

Table 4 presents regression results of the link between product market competition and analysts' forecast accuracy. In model 1, the industry-adjusted Lerner Index is regressed on analysts' forecast accuracy. Conform hypothesis 1, I find that analysts are more accurate in predicting quarterly earnings of firms that have more pricing power. A one standard deviation increase in the Lerner Index leads to a 44.1% increase in forecast accuracy from its mean value. Hence, the effect of pricing power, when measured in isolation, on analysts' forecast accuracy is both statistically and economically significant. This is consistent with the argument that high pricing power firms are better able to maintain their profit margin and that financial analysts therefore learn more about future firm profitability from historical earnings. In model 2, the results are presented for the full model, where other factors that have been found to affect analysts' forecast accuracy are controlled for. The coefficient of the Lerner Index drops from 0.540 to 0.299 but is still highly significant at the 1% significance level. The inclusion of the control variables lowers the economic power of the Lerner Index on analyst forecasts as well. A one standard deviation decrease in the pricing power index leads to a 24.4% decrease in the aggregate accuracy of analysts' quarterly earnings forecasts. Hence, a firm's pricing power is valuable information to analysts. Of the control variables, I find that analyst forecast accuracy increases in firm size and quarterly stock turnover whereas it decreases in the historical volatility of profitability and leverage, as expected. On the other hand, analyst coverage and firm age have a negative sign where a positive sign was expected. However, firm size has a strong positive correlation with both analyst coverage and firm age and thus captures most of the positive effect analyst coverage and firm age have on analyst forecast accuracy. Overall, I find that analysts' forecast accuracy increases in a firm's pricing power, even after controlling for factors such as firm size, analyst coverage and historical volatility of profitability that have been documented to influence forecast accuracy.

In model 3, the Herfindahl Index is regressed on analyst forecast accuracy. As hypothesized, greater industry concentration is associated with more accurate quarterly earnings estimates. This result is consistent with firms in more concentrated industries having superior information environments. A superior information environment reduces the complexity of estimating quarterly earnings. A one standard deviation increase in the Herfindahl Index, however, only leads to a 5.0%

Table 4

Product market power and analyst forecast accuracy. This table reports the results of ordinary least square (OLS) regressions explaining the role of product market power on analyst forecast accuracy. The sample consists of firms which are followed by at least two analysts in the I/B/E/S database and with financial information in the CRSP/COMPUSTAT merged database in the period 1986 - 2015. The dependent variable is *forecast accuracy*, defined as the negative of the absolute difference between analyst consensus quarterly EPS forecast and the firm's actual quarterly EPS, standardized by the stock price on the trading day preceding the forecast date. *Lerner Index* is constructed as the difference between the firm's Lerner Index and the average Lerner Index of the two-digit SIC industry. *Herfindahl Index* is the squared sum of market share of firm sales within a SIC/NAICS industry. *Size* is the natural logarithm of a firm's market capitalization in millions of USD in the quarter before the earnings announcement. *Analyst coverage* is the natural logarithm of the number of analysts covering a firm in a quarter. *Leverage* is computed as total long-term debt divided by total assets. *Turnover* is defined as the natural logarithm of the dollar volume of shares traded divided by the number of shares outstanding in the quarter. *Volatility* is the natural logarithm historical volatility of profitability, measured as one plus the standard deviation of quarterly return on equity over the preceding three years. *Age* is the natural logarithm of one plus the number of years a firm has been listed on CRSP. Time-fixed effects and industry-fixed effects are included in the model. Standard errors are clustered by firm. Absolute values of t-statistics are displayed in parentheses, below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5% and 10% levels respectively, for the two-tailed hypothesis test that the coefficient equals zero.

Variable	Predicted sign	Model 1	Model 2	Model 3	Model 4	Model 5
Lerner Index × 100	+	0.540***	0.300***			0.299***
		(23.53)	(13.35)			(13.31)
Herfindahl Index × 100	+			1.076***	-1.393***	-1.284***
				(3.50)	(4.73)	(4.51)
Size × 100	+		0.314***		0.340***	0.316***
			(29.67)		(31.78)	(29.73)
Analyst Coverage × 100	+		-0.144***		-0.156***	-0.143***
			(10.54)		(11.28)	(10.45)
Leverage × 100	-		-0.650***		-0.596***	-0.644***
			(12.89)		(11.73)	(12.78)
Turnover × 100	+		0.055***		0.054***	0.055***
			(7.53)		(7.17)	(7.48)
Volatility × 100	-		-0.553***		-0.681***	-0.554***
			(9.74)		(11.71)	(9.78)
Age × 100	+		-0.090***		-0.078***	-0.087***
			(8.59)		(7.37)	(8.35)
Industry fixed effects		Yes	Yes	Yes	Yes	Yes
Time fixed effects		Yes	Yes	Yes	Yes	Yes
N		197,827	158,821	197,827	158,821	158,821
R^2		0.073	0.179	0.041	0.170	0.179

increase in forecast accuracy from its mean value. Besides, the Herfindahl Index coefficient switches signs and becomes significantly negative following the inclusion of control variables in model 4. A one standard deviation increase in industry concentration is associated with a 6.9% decrease, instead of a hypothesized increase, in the accuracy of analysts' forecasts. An explanation is that more monopolistic firms effectively provide less information to analysts to protect their competitive advantage, resulting in an inferior information environment compared to the equivalent firm in a more competitive industry. All control variables have the same sign and significance level as in model 2. Thus, I find that it is more complex to forecast earnings of firms in more concentrated industries, holding all other variables constant, and find no support for the hypothesized positive relationship between industry concentration and analyst forecast accuracy. This result is similar to the findings of Ali et al. (2014).

In model 5, both the Lerner Index and the Herfindahl Index are included in the regression, along with all control variables. The coefficients and significance of the Lerner Index and Herfindahl Index change little in this regression compared to model 2 and 4, thus lending credibility to the argument that the Lerner Index and Herfindahl Index measure different aspects of product market power.

In table 6, a number of robustness checks are presented. In model 1, I use alternative proxies for pricing power and industry concentration, that is, the non-industry-adjusted Lerner Index and the Herfindahl Index from the U.S. Economic Census for Census years. The coefficient of the Lerner Index is almost identical to that of the industry-adjusted Lerner Index whereas the coefficient of the U.S. Census Herfindahl Index increases somewhat. Nonetheless, the results are robust to these alternative specifications of pricing power and industry concentration. In model 2, I apply Fama-MacBeth (1973) regressions with industry fixed effects and standard errors clustered by firm, following Datta et al. (2011). With Fama-MacBeth regressions, separate cross-sectional regression are run for every quarter and the coefficient estimates are subsequently averaged over all cross-sectional regressions to obtain the estimate of the effect of the variable. This approach accounts for time-fixed effects but assumes that there are no firm fixed effects. The pricing power coefficient and the industry concentration coefficient both increase in magnitude with a Fama-MacBeth regression compared to a fixed effect regression. The reason for this is that a Fama-MacBeth regression applies equal weighting to the quarterly cross-sectional regressions, whereas fixed effect regressions weigh by the total number of observations. Since fewer observations come from the earlier quarters in the sample and the relationship between product market power and forecast accuracy was somewhat stronger in those quarters, the coefficient estimates increase. Nonetheless, conclusions do not change. In model 3, I exclude control variables for volatility of historical profitability and firm age from the full regression model, as the inclusion of these variables could lead to an understatement of the product market power coefficients. The pricing power coefficient shows a limited increase while the coefficient of industry concentration decreases somewhat, while other control variables also do not see a material change. Hence, the results are more pronounced when historical volatility of profitability and firm age are excluded from the regression, but the general conclusion remains the same.

Overall, I find mixed evidence for hypothesis 1. An increase in a firm’s product pricing power improves analyst quarterly earnings forecasts on average, as expected. This is consistent with the notion that monopolistic firms are better insulated from exogenous cost shocks and therefore better able to maintain their profit margin, leading to more stable earnings and increased earnings predictability. On the other hand, I find that analysts' forecasts are less accurate for firms in more concentrated industries. This finding is likely related to an inferior information environment of firms in concentrated industries. Nevertheless, a firm's product market power is valuable information to analysts as it helps them to make more accurate estimates of future firm earnings.

6.2 Analyst forecast dispersion

Table 5 documents the regression results of the relationship between product market power and analyst forecast dispersion. The regression specifications are similar to the analysis of analysts' forecast accuracy and product market power. In model 1, the Lerner Index is regressed on forecast dispersion. Conform hypothesis 2, I find that higher product pricing power leads to more agreement among analysts on the expected level of earnings per share for the quarter. A one standard deviation increase in the Lerner Index reduces analyst dispersion by 48.9% from its mean. This is consistent with an explanation where higher product pricing power is associated with more stable profit margins which consequently lowers informational uncertainty among analysts. In column 2, control variables are again included in the regression. The coefficient on the Lerner Index increases from -0.265 to -0.173 but is still significantly negatively related to forecast dispersion at the one percent significance level. The economic impact of the Lerner Index on forecast dispersion also drops after including the control variables, although it remains substantial. A one standard deviation decrease in the Lerner Index leads to an increase in disagreement among analysts by 9.5% from its mean value. This confirms that a firm's pricing power is informative to analysts when making earnings forecasts, as increasing pricing power reduces future earnings uncertainty and correspondingly the range of analysts' estimates. Most control variables have their predicted sign, with a negative coefficient for firm size and quarterly stock turnover and a positive coefficient for all other variables. Only firm age has a negative coefficient where a positive coefficient was expected, the likely reason is again the high positive correlation with firm size. Overall, I find that product pricing power has a significant positive relationship with the level of agreement among analysts.

In model 3, I regress industry concentration on analyst disagreement. I find that the Herfindahl Index is significantly negatively related to forecast dispersion. This implies that analysts' quarterly

Table 5

Product market power and analyst forecast dispersion. This table reports the results of ordinary least square (OLS) regressions explaining the role of product market power on analyst forecast dispersion. The sample consists of firms which are followed by at least two analysts in the I/B/E/S database and with financial information in the CRSP/COMPUSTAT merged database in the period 1986 - 2015. The dependent variable is *forecast dispersion*, defined as the standard deviation of all earnings forecasts for a firm in a quarter divided by the stock price on the trading day preceding the forecast date. *Lerner Index* is constructed as the difference between the firm's Lerner Index and the average Lerner Index of the two-digit SIC industry. *Herfindahl Index* is the squared sum of market share of firm sales within a SIC/NAICS industry. *Size* is the natural logarithm of a firm's market capitalization in millions of USD in the quarter before the earnings announcement. *Analyst coverage* is the natural logarithm of the number of analysts covering a firm in a quarter. *Leverage* is computed as total long-term debt divided by total assets. *Turnover* is defined as the natural logarithm of the dollar volume of shares traded divided by the number of shares outstanding in the quarter. *Volatility* is the natural logarithm of historical volatility of profitability, measured as one plus the standard deviation of quarterly return on equity over the preceding three years. *Age* the natural logarithm of one plus the number of years a firm has been listed on CRSP. Time-fixed effects and industry-fixed effects are included in the model. Standard errors are clustered by firm. Absolute values of t-statistics are displayed in parentheses, below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5% and 10% levels respectively, for the two-tailed hypothesis test that the coefficient equals zero.

Variable	Predicted sign	Model 1	Model 2	Model 3	Model 4	Model 5
Lerner Index × 100	-	-0.265***	-0.174***			-0.173***
		(30.02)	(19.69)			(19.66)
Herfindahl Index × 100	-			-0.341***	0.613***	0.550***
				(2.66)	(4.62)	(4.41)
Size × 100	-		-0.126***		-0.141***	-0.127***
			(30.19)		(32.76)	(30.26)
Analyst Coverage × 100	+		0.088***		0.096***	0.088***
			(15.71)		(16.37)	(15.61)
Leverage × 100	+		0.302***		0.272***	0.300***
			(14.67)		(12.78)	(14.52)
Turnover × 100	-		-0.030***		-0.029***	-0.029***
			(9.58)		(8.86)	(9.53)
Volatility × 100	+		0.291***		0.365***	0.292***
			(12.12)		(14.51)	(12.17)
Age × 100	-		0.035***		0.029***	0.034***
			(8.08)		(6.36)	(7.82)
Industry fixed effects		Yes	Yes	Yes	Yes	Yes
Time fixed effects		Yes	Yes	Yes	Yes	Yes
N		197,827	158,821	197,827	158,821	158,821
R^2		0.121	0.243	0.067	0.222	0.243

earnings estimates are more aligned when firms operate in more concentrated industries. A one standard deviation increase in the Herfindahl Index decreases analyst dispersion by 3.5% from its mean. Hence, the economic impact of industry concentration on analyst disagreement is limited when measured in isolation. In model 4, the control variables are once more added to the regression. Higher industry concentration is found to lead to greater disagreement among analysts, contrary to what was hypothesized. Again, a potential reason for this finding is that more monopolistic firms might make less information public than firms in more fragmented industries, holding all other variables constant. As a result, analysts rely on less accurate information and have to make more assumptions in their earnings estimates for firms in concentrated industries, leading to a wider range of analysts' estimates. A one standard deviation increase in the Herfindahl Index increases the level of analyst disagreement by 6.8% from its mean value. Although the effect is opposite from what was hypothesized, these results confirm that the level of industry concentration provides considerable information to analysts when forecasting earnings. The control variables all have their expected sign and significance, except for firm age as discussed above.

In model 5 both the Lerner Index and Herfindahl index are included in the regression on analyst forecast dispersion. The coefficients on product pricing power and industry concentration do not change, again consistent with both variables measuring different aspects of product market power.

Table 6

Robustness checks. This table reports robustness checks of regressions explaining the role of product market power on analyst forecast accuracy and analyst forecast dispersion. The sample consists of firms which are followed by at least two analysts in the I/B/E/S database and with financial information in the CRSP/COMPUSTAT merged database in the period 1986 - 2015. The dependent variable is *forecast accuracy* in model 1, 2 and 3, defined as the negative of the absolute difference between analyst consensus quarterly EPS forecast and the firm's actual quarterly EPS, standardized by the stock price on the trading day preceding the forecast date. The dependent variable in model 4, 5 and 6 is *forecast dispersion,* defined as the standard deviation of all earnings forecasts for a firm in a quarter divided by the stock price on the trading day preceding the forecast date. *Lerner Index* is measured as the price-cost margin, defined as sales minus cost of goods sold and selling, general and administrative expenses divided by sales. *Industry-adjusted Lerner Index* is constructed as the difference between the firm's Lerner Index and the average Lerner Index of the two-digit SIC industry. *Herfindahl Index* is the squared sum of market share of firm sales within a SIC/NAICS industry. *Herfindahl Index Census* is the Herfindahl Index as calculated by the U.S. Census in Census years within a two-digit SIC industry. *Size* is the natural logarithm of a firm's market capitalization in millions of USD in the quarter before the earnings announcement. *Analyst coverage* is the natural logarithm of the number of analysts covering a firm in a quarter. *Leverage* is total long-term debt divided by total assets. *Turnover* is defined as the natural logarithm of the dollar volume of shares traded divided by the number of shares outstanding in the quarter. *Volatility* is the natural logarithm historical volatility of profitability, measured as one plus the standard deviation of quarterly return on equity over the preceding three years. *Age* is the natural logarithm of one plus the number of years a firm has been listed on CRSP. Model 1, 3, 4 and 6 report OLS regressions with time-fixed effects and industry-fixed effects. Model 2 and 5 report Fama-MacBeth (1973) regressions with industry fixed effects. Standard errors are clustered by firm. Absolute values of t-statistics are displayed in parentheses, below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5% and 10% levels respectively, for the two-tailed hypothesis test that the coefficient equals zero.

Variable	Analyst forecast accuracy			Analyst forecast dispersion		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Lerner Index × 100	0.302***			-0.182***		
	(9.08)			(-12.73)		
Industry-adjusted Lerner Index × 100		0.573***	0.323***		-0.227***	-0.183***
		(9.55)	(15.95)		(-16.83)	(-23.16)
Census Herfindahl Index × 100	-1.274***			0.551***		
	(-5.88)			(5.84)		
Herfindahl Index × 100		-1.195***	-1.553***		0.347***	0.673***
		(-10.18)	(-5.43)		(7.33)	(5.02)
Size × 100	0.291***	0.303***	0.286***	-0.120***	-0.118***	-0.116***
	(17.92)	(30.55)	(31.87)	(-19.49)	(-30.92)	(-32.51)
Analyst coverage × 100	-0.156***	-0.162***	-0.128***	0.094***	0.092***	0.080***
	(-6.83)	(-11.28)	(-10.23)	(10.39)	(15.66)	(15.45)
Leverage × 100	-0.577***	-0.730***	-0.774***	0.282***	0.383***	0.365***
	(-7.19)	(-14.98)	(-15.53)	(8.82)	(19.54)	(17.92)
Turnover × 100	0.074***	0.045***	0.064***	-0.039***	-0.021***	-0.032***
	(5.87)	(6.70)	(9.40)	(-8.04)	(-7.55)	(-11.25)
Volatility × 100	-0.594***	-1.392***		0.280***	0.638***	
	(-6.08)	(-5.37)		(7.20)	(5.44)	
Age × 100	-0.061***	-0.094***		0.026***	0.045***	
	(-4.05)	(-14.05)		(4.09)	(14.22)	
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	No	Yes	Yes	No	Yes
N	25,851	158,821	186,124	25,851	158,821	186,124
R^2	0.178	0.168	0.171	0.238	0.206	0.229

I perform the same series of robustness checks as in section 6.2 on analyst forecast accuracy, which are also reported in table 6. In model 4, I use the non-industry-adjusted Lerner Index and the U.S. Census Herfindahl Index as the main focus variables. The Herfindahl Index coefficient decreases slightly, while there is a limited increase in the Lerner Index compared to the full regression model. Nonetheless, conclusions do not change. In model 5, I find that coefficient of pricing power and industry concentration change slightly but confirm that the results are robust to Fama-MacBeth regression specifications. In model 6, I exclude control variables for historical volatility of profitability and firm age from the full regression model. This leads to a limited decrease in the coefficient for pricing power and a small increase in the Herfindahl Index coefficient. Overall, the robustness checks validate the results.

Thus, similar to the results on analyst forecast accuracy, I find mixed evidence for hypothesis 2. Conform hypothesis 2, analyst disagreement is greater for firms that have less pricing power. A likely explanation for this finding is that these firms are expected to have lower ability to protect their profit margin from exogenous shocks. This makes earnings more volatile and increases informational uncertainty among analysts. Contrary to hypothesis 2, analyst disagreement is smaller for firms in more fragmented industries. This finding is consistent with an explanation where firms in more concentrated industries have inferior information environments because they disclose less to protect their abnormal profits. Overall, I confirm that a firm's product market power provides valuable information to analysts, as analysts disagree more for firms with less pricing power and firms in more concentrated industries, on average.

6.3 Earnings announcement returns

Table 7 presents the regression results of market power on absolute announcement returns over a five-day event window. In model 1, solely the Lerner Index is regressed on the earnings announcement return. The coefficient on the Lerner Index is significantly negative, indicating that the stock price reaction is smaller for firms with more product pricing power. A one standard deviation increase in a firm's pricing power leads to a 0.5 percentage point lower absolute earnings announcement return or a 7.1% decrease in the average absolute announcement return from its mean value. This is consistent with the findings of Peress (2010) and lends credibility to the argument that stock prices of high pricing power firms are more informative and therefore show a smaller adjustment to an earnings announcement. However, the smaller stock price response of high market power firms to earnings announcements could also be related to the size of the earnings surprise. Analyst forecast errors tend to be larger for firms with less pricing power, hence it could be that less information is conveyed to investors in the announcement. Therefore, I add a term for absolute analyst forecast errors and an interaction term between market power and the forecast errors to the regression. As presented in model 2, the coefficient of pricing power is still significantly negative after controlling for the surprise factor in the earnings announcement. The economic power of the Lerner Index drops somewhat, a one-standard deviation increase leads to 6.9% lower absolute announcement returns, when the forecast error is zero. This confirms that the negative relationship between pricing power and announcement returns is only marginally related to the size of the forecast error. Moreover, the interaction effect between pricing power and forecast errors is significantly positive, as expected. Hence, absolute announcement returns increase by the combined effect of the size of the forecast error and a firm's pricing power. This is consistent with the notion that investors attach more weight to a given earnings surprise when earnings uncertainty is lower because earnings are expected to be more persistent. To test whether the smaller absolute reaction of investors to earnings announcement of high pricing power firms originates from lower ex-ante earnings uncertainty, I include analyst forecast dispersion in model 3. I find that absolute earnings announcement returns are increasing in analyst forecast dispersion, as expected, but that the coefficient of pricing power and the interaction term change only marginally and remain significant at the 1% significance level. This suggests that the impact of a firm's pricing power on investor responses to earnings announcement is not primarily derived from analyst forecast uncertainty.

Moreover, I include control variables for additional factors that influence earnings announcement returns in model 4. The coefficient of pricing power decreases in magnitude but remains significantly negative after the inclusion of firm size, analyst coverage, leverage, stock turnover, historical volatility of profitability and firm age. The economic power of the Lerner Index decreases after including the control variables, a one-standard deviation increase leads to 1.3% lower absolute announcement returns from its mean value when forecast errors are zero. The interaction effect between analyst forecast accuracy and pricing power also loses some of its power but remains significantly negative at the 1% significance level. Of the control variables, analyst coverage, leverage and quarterly stock turnover do not have their predicted sign. Possible explanations for these observations could be that firms that get more attention from analysts and traders also get more attention from the market following an earnings announcement, leading to

Table 7

Product market power and quarterly earnings announcement returns. This table reports the results of ordinary least square (OLS) regressions explaining the role of product market power on quarterly earnings announcement returns. The sample consists of firms which are followed by at least two analysts in the I/B/E/S database and with financial information in the CRSP/COMPUSTAT merged database in the period 1986 - 2015. The dependent variable is the *5-day abnormal absolute announcement return,* defined as the absolute difference between the expected stock return of a firm over the 5-day period around an earnings announcement, based on the residuals of the Fama-French three-factor model over an estimation window from t = -250 until t = -5, and the 5-day raw stock return. *Lerner Index* is constructed as the difference between the firm's Lerner Index and the average Lerner Index of the two-digit SIC industry. *Herfindahl Index* is the squared sum of market share of firm sales within a SIC/NAICS industry. *Size* is the natural logarithm of a firm's market capitalization in millions of USD in the quarter before the earnings announcement. *Forecast error* is the absolute difference between analyst consensus quarterly EPS forecast and the firm's actual quarterly EPS, standardized by the stock price on the trading day preceding the forecast date. *Dispersion* is measured as the standard deviation of all earnings forecasts for a firm in a quarter divided by the stock price on the trading day preceding the forecast date. *Analyst coverage* is the natural logarithm of the number of analysts covering a firm in a quarter. Leverage is total long-term debt divided by total assets, weighted by firm total assets. *Turnover* is defined as the natural logarithm of the dollar volume of shares traded divided by the number of shares outstanding in the quarter. *Volatility* is the natural logarithm of historical volatility of profitability, measured as one plus the standard deviation of quarterly return on equity over the preceding three years. *Age* is the natural logarithm of one plus the number of years a firm has been listed on CRSP. Time-fixed effects and industry-fixed effects are included in the model. Standard errors are clustered by firm. Absolute values of t-statistics are displayed in parentheses, below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5% and 10% levels respectively, for the two-tailed hypothesis test that the coefficient equals zero.

Variable	Predicted sign	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Lerner Index	-	-0.010***	-0.009***	-0.008***	-0.002***				
		(-19.01)	(-16.65)	(-14.99)	(-3.44)				
Lerner Index × Forecast Error	+		0.183***	0.181***	0.125***				
			(9.08)	(8.97)	(5.74)				
Herfindahl Index	-					-0.085***	-0.092***	-0.090***	-0.021**
						(-5.91)	(-6.95)	(-6.93)	(-2.07)
Herfindahl Index × Forecast Error	+						2.782***	2.659***	2.729***
							(3.81)	(3.81)	(3.15)
Forecast error	+		0.654***	0.512***	0.399***		0.464***	0.300***	0.191***
			(35.32)	(25.40)	(18.19)		(10.18)	(6.78)	(3.57)
Dispersion	+			0.677***	0.433***			0.787***	0.431***
				(13.57)	(7.67)			(15.84)	(7.64)
Size	-				-0.008***				-0.008***
					(-30.31)				(-30.57)
Analyst Coverage	-				0.005***				0.005***
					(10.86)				(10.88)
Leverage	+				-0.007***				-0.007***
					(-5.02)				(-4.95)
Turnover	-				0.005***				0.005***
					(25.02)				(25.00)
Volatility	+				0.008***				0.008***
					(5.42)				(5.63)
Age	-				-0.005***				-0.005***
					(-17.10)				(-17.05)
Industry fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N		190,952	190,952	190,952	158,687	190,952	190,952	190,952	158,687
Adjusted-R^2		0.097	0.112	0.114	0.141	0.093	0.110	0.112	0.141

higher absolute announcement returns. On the other hand, investors might stay away from more leveraged, riskier stocks and consequently devote less attention to their earnings announcements, which could explain their lower announcement returns. Overall, I find that absolute earnings announcement returns are lower for firms with high pricing power and that investors respond more strongly to earnings surprises of higher pricing power firms. This is consistent with investors learning less from earnings announcements when stock sophistication is greater and attaching more weight to surprises in earnings announcements when earnings are likely to be more persistent.

The same analysis is repeated with the Herfindahl Index as the main variable of interest. In model 5, solely the Herfindahl Index is regressed on the absolute earnings announcement return. Similar to the findings for pricing power, the coefficient on the Herfindahl Index is significantly negative, indicating that the absolute stock price reaction is smaller for firms in more concentrated industries. A one-standard deviation increase in the Herfindahl Index decreases absolute announcement returns by 3.4%. This finding is therefore consistent with less earnings uncertainty being incorporated into the stock price of more monopolistic firms prior to an earnings announcement. Model 6 presents the regression results when analyst forecast accuracy and an interaction term between market power and absolute forecast errors are included in the regression. The coefficient on industry concentration remains significantly negative, whereas the interaction term between industry concentration and the forecast error is significantly positive. Thus, similar to the findings for pricing power in model 2, I find that investors respond both less strongly to earnings announcements and attach more weight to a given earnings surprise of more monopolistic firms. In column 7, analyst forecast dispersion is included as a control variable in the regression. The coefficient of industry concentration changes marginally, whereas the interaction effect also remains significantly positively related to absolute announcement returns. In column 8, the other control variables are included in the regression. The control variables have similar coefficients and significance as in model 4. The coefficient on the Herfindahl Index loses some of its power but remains significantly negatively related to announcement returns. A one-standard deviation increase in the Herfindahl Index decreases absolute announcement returns by 1.1% from its mean value when the forecast error is zero. Hence, the economic impact is limited. Similarly, the interaction effect between industry concentration and absolute forecast errors remains significantly positive. Hence, comparable to the findings on the relationship between pricing power and earnings announcement returns, I find that stock price reactions to earnings announcements are smaller and investors weigh earnings surprises of firms in concentrated industries more heavily, as less news and noise and is likely to be included in the earnings announcement.

Table 8 reports robustness checks with different event windows for the earnings announcement return. I apply 3-day event windows, from t= -1 until t= 1, 11-day event windows, from t= -5 until t= 5, and 21-day event windows, from t= -10 until t= 10. From model 1 it follows that the

Table 8

Robustness checks. This table reports robustness checks of regressions explaining the role of product market power on quarterly earnings announcement returns. The sample consists of firms with at least two analysts following in the I/B/E/S database and with financial information in the CRSP/COMPUSTAT merged database in the period 1986 - 2015. The dependent variable is the 3-, 11- or 21-day abnormal absolute announcement return, defined as the difference between the expected stock return of a firm over the 3-, 11- or 21-days surrounding an earnings announcement, based on the residuals of the Fama-French three-factor model over an estimation window from t = -250 until t = -3, -11 or -21, and the 3-, 11- or 21-day raw stock return. *Lerner Index* is constructed as the difference between the firm's Lerner Index and the average Lerner Index of the two-digit SIC industry. *Herfindahl Index* is the squared sum of market share of firm sales within a SIC/NAICS industry. *Size* is the natural logarithm of a firm's market capitalization in millions of USD in the quarter before the earnings announcement. *Analyst coverage* is the number of analysts covering a firm in a quarter. *Leverage* is total long-term debt divided by total assets, weighted by firm total assets. *Turnover* is defined as the natural logarithm of the dollar volume of shares traded divided by the number of shares outstanding in the quarter. *Volatility* is the natural logarithm of historical volatility of profitability, measured as one plus the standard deviation of quarterly return on equity over the preceding three years. *Age* is the natural logarithm of one plus the number of years a firm has been listed on CRSP. Time-fixed effects and industry-fixed effects are included in the model. Standard errors are clustered by firm. Absolute values of t-statistics are displayed in parentheses, below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5% and 10% levels respectively, for the two-tailed hypothesis test that the coefficient equals zero.

Variable	Predicted sign	Model 1 3-day	Model 2 11-day	Model 3 21-day	Model 4 3-day	Model 5 11-day	Model 6 21-day
Lerner Index	-	0.000	-0.004***	-0.011***			
		(0.26)	(-6.33)	(-11.29)			
Lerner Index × Forecast Error	+	0.095***	0.147***	0.245***			
		(4.95)	(5.17)	(6.35)			
Herfindahl Index	-				-0.024**	-0.017	-0.024
					(-2.56)	(-1.31)	(-1.41)
Herfindahl Index × Forecast Error	+				2.516***	3.464***	3.652***
					(3.42)	(3.30)	(2.60)
Forecast Error	+	0.365***	0.497***	0.634***	0.178***	0.238***	0.333***
		(18.71)	(18.02)	(18.15)	(3.97)	(3.70)	(3.79)
Dispersion	+	0.302***	0.712***	1.179***	0.278***	0.738***	1.276***
		(6.21)	(9.96)	(12.74)	(5.74)	(10.39)	(13.85)
Size	-	-0.007***	-0.010***	-0.011***	-0.007***	-0.010***	-0.011***
		(-30.56)	(-30.82)	(-26.66)	(-30.27)	(-31.46)	(-27.97)
Analyst Coverage	-	0.006***	0.004***	0.003***	0.006***	0.005***	0.004***
		(12.99)	(7.88)	(4.64)	(12.90)	(7.98)	(4.91)
Leverage	+	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***	-0.008***
		(-5.40)	(-3.70)	(-2.95)	(-5.11)	(-3.89)	(-3.43)
Turnover	-	0.005***	0.007***	0.008***	0.005***	0.007***	0.008***
		(26.19)	(25.55)	(24.39)	(26.06)	(25.62)	(24.50)
Volatility	+	0.007***	0.013***	0.023***	0.007***	0.014***	0.026***
		(5.29)	(7.20)	(9.09)	(5.06)	(7.79)	(10.28)
Age	-	-0.005***	-0.007***	-0.009***	-0.005***	-0.007***	-0.010***
		(-16.60)	(-17.62)	(-18.80)	(-16.33)	(-17.76)	(-19.09)
Industry fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
N		158,703	158,648	158,508	158,703	158,648	158,508
Adjusted-R^2		0.137	0.150	0.170	0.136	0.150	0.168

coefficient for the Lerner Index for 3-day event window is not significantly different from zero in the regression with pricing power as the main focus variable. It could be the case that this window is too small to fully capture the relationship between pricing power and announcement returns. For all other intervals the results are robust, although the effect of pricing power and its interaction effect with analyst forecast accuracy increase in magnitude with the length of the event window. In model 4, 5 and 6 I apply the three alternative event windows to the regression of industry concentration on earnings announcement returns. The Herfindahl Index coefficient has similar coefficients and significance for the 3-day event window, whereas the significance of the Herfindahl Index coefficient drops below the 10% significance level and the interaction effect between the Herfindahl Index and the forecast error increases in magnitude for 11- and 21-day windows. Thus, I find that the findings are dependent on the specification of the event window.

Overall, I find that product market power is negatively associated with absolute earnings announcement returns and that investors respond more strongly to a given earnings surprise if a firm has more market power. This is consistent with earnings announcements of high market power firms containing less new information, which leads to lower investor learning, and less noise, which sends a stronger informational signal. Hence, I accept hypothesis 3. Stock price returns to earnings surprises are dependent on product market power. Nonetheless, results should be interpreted with care as findings are not robust to the specification of the event window.

6.4 Asymmetric investor responses to earnings surprises

Furthermore, I analyze whether investors respond asymmetrically to positive and negative earnings surprises, depending on a firm's market power. Panel A of table 9 presents average absolute earnings announcement return by sign of the earnings surprise and pricing power quintile, as well as the frequency of returns by earnings surprise sign. Over the entire sample, positive earnings surprises occur more frequently than negative surprises, as has previously been documented in the literature. Low pricing power firms have more negative than positive earnings surprises whereas high pricing power firms are almost twice as likely to have a positive earnings surprise as opposed to a negative one. This suggests that analysts are too optimistic in forecasting earnings of low pricing power firms whereas they frequently underestimate quarterly earnings of high pricing power firms. Absolute announcement returns are higher for low pricing power firms than high pricing power firms regardless of the sign of the earnings surprise. However, the difference in absolute announcement returns between high and low pricing power firms is greater for negative earnings surprises. Moreover, absolute announcement returns following negative earnings surprises are significantly stronger than those following positive surprises in quintile 1, whereas the opposite holds in quintile 2, 3, 4 and 5. Over the entire sample there is no significant difference in announcement returns between positive and negative earnings surprises.

In panel B the equivalent statistics are presented by industry concentration quintiles. Earnings surprises are more likely to be positive in all industry concentration quintiles, while average absolute announcement returns are higher for firms in fragmented industries. Moreover, announcement returns are higher following positive earnings surprises as opposed to negative surprises in quintile 1, whereas the opposite holds in quintile 4 and 5. Hence, investors appear to react more strongly to positive earnings announcements of firms in fragmented industries and to negative earnings announcements of monopolistic firms.

Table 9

Product market power and asymmetry of quarterly earnings announcement returns. This table reports mean absolute earnings announcement returns by earnings surprise sign and product market competition quintile. Panel A reports the statistics based on industry-adjusted Lerner Index quintiles. Panel B reports the statistics based on Herfindahl Index quintiles. The sample consists of firms which are followed by at least two analysts in the I/B/E/S database and with financial information in the CRSP/COMPUSTAT merged database in the period 1986 - 2015. Earnings announcement returns are based on the *5-day abnormal absolute announcement return*, defined as the absolute difference between the expected stock return of a firm over the 5-day period around an earnings announcement, based on the residuals of the Fama-French three-factor model over an estimation window from t = -250 until t = -5, and the 5-day raw stock return. The absolute abnormal announcement return is winsorized at the 1/99% level. *Positive* refers to positive earnings surprises, when earnings are better than expected. *Neutral* refers to a situation where expected earnings equal actual earnings. *Negative* refers to negative earnings surprises, when earnings are lower than expected. Frequencies are reported in brackets.

Variable	Earnings surprise			
	Negative	Neutral	Positive	All
Panel A: Quintiles based on industry-adjusted Lerner Index				
Quintile 1	8.24%	7.85%	7.90%	8.07%
	(53.2%)	*(8.1%)*	*(38.7%)*	*(100.0%)*
Quintile 2	7.19%	6.95%	7.24%	7.19%
	(42.7%)	*(10.3%)*	*(47.1%)*	*(100.0%)*
Quintile 3	6.54%	6.40%	6.75%	6.64%
	(35.8%)	*(10.7%)*	*(53.5%)*	*(100.0%)*
Quintile 4	6.30%	6.24%	6.64%	6.49%
	(31.6%)	*(11.3%)*	*(57.1%)*	*(100.0%)*
Quintile 5	6.48%	6.42%	6.84%	6.68%
	(29.5%)	*(11.7%)*	*(58.8%)*	*(100.0%)*
Panel B: Quintiles based on Herfindahl Index				
Quintile 1	7.53%	7.62%	7.60%	7.58%
	(39.3%)	*(10.0%)*	*(50.7%)*	*(100.0%)*
Quintile 2	7.12%	6.67%	7.12%	7.06%
	(38.6%)	*(11.5%)*	*(49.9%)*	*(100.0%)*
Quintile 3	7.14%	6.77%	7.18%	7.12%
	(36.4%)	*(11.2%)*	*(52.4%)*	*(100.0%)*
Quintile 4	7.16%	6.63%	6.87%	6.96%
	(38.9%)	*(9.9%)*	*(51.2%)*	*(100.0%)*
Quintile 5	6.55%	5.77%	6.27%	6.33%
	(39.2%)	*(9.5%)*	*(51.3%)*	*(100.0%)*
Total	7.10%	6.70%	7.01%	7.01%
	(38.5%)	*(10.4%)*	*(51.1%)*	*(100.0%)*

Table 10 presents the regression results of the relationship between product market power and earnings announcement returns in relation to positive and negative earnings surprises. The coefficient of pricing power is significantly negative for both positive and negative earnings surprises, although the magnitude of the effect is significantly stronger for negative earnings surprises, as presented in model 1. In model 2, I add forecast errors, the interaction term between market power and forecast errors, forecast dispersion, and the other control variables to the

Table 10

Product market power and asymmetry of quarterly earnings announcement returns. This table reports the results of ordinary least square (OLS) regressions explaining the role of product market power on quarterly earnings announcement returns in connection to the sign of the earnings surprise. The sample consists of firms which are followed by at least two analysts in the I/B/E/S database and with financial information in the CRSP/COMPUSTAT merged database in the period 1986 - 2015. The dependent variable is the *5-day abnormal absolute announcement return*, defined as the absolute difference between the expected stock return of a firm over the 5-days surrounding an earnings announcement, based on the residuals of the Fama-French three-factor model over an estimation window from t = -250 until t = -5, and the 5-day raw stock return. *Positive surprise* refers to positive earnings surprises, when earnings are better than expected. *Lerner Index* is constructed as the difference between the firm's Lerner Index and the average Lerner Index of the two-digit SIC industry. *Herfindahl Index* is the squared sum of market share of firm sales within a SIC/NAICS industry. *Forecast error* is the absolute difference between analyst consensus quarterly EPS forecast and the firm's actual quarterly EPS, standardized by the stock price on the trading day preceding the forecast date. *Dispersion* is measured as the standard deviation of all earnings forecasts for a firm in a quarter divided by the stock price on the trading day preceding the forecast date. *Size* is the natural logarithm of a firm's market capitalization in millions of USD in the quarter before the earnings announcement. *Analyst coverage* is the natural logarithm of the number of analysts covering a firm in a quarter. *Leverage* is total long-term debt divided by total assets, weighted by firm total assets. *Turnover* is defined as the natural logarithm of the dollar volume of shares traded divided by the number of shares outstanding in the quarter. *Volatility* is natural logarithm of the historical volatility of profitability, measured as one plus the standard deviation of quarterly return on equity over the preceding three years. *Age* is the natural logarithm of one plus the number of years a firm has been listed on CRSP. Time-fixed effects and industry-fixed effects are included in the model. Standard errors are clustered by firm. Absolute values of t-statistics are displayed in parentheses, below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5% and 10% levels respectively, for the two-tailed hypothesis test that the coefficient equals zero.

Variable	Model 1	Model 2	Model 3	Model 4
Lerner Index	-0.011***	-0.003***		
	(-16.73)	(-4.22)		
Lerner Index × Positive surprise	0.003***	0.002**		
	(3.99)	(2.42)		
Lerner Index × Forecast error		0.050*		
		(1.83)		
Lerner Index × Forecast error × Positive surprise		0.242***		
		(5.28)		
Herfindahl Index			-0.073***	-0.025**
			(-4.09)	(-2.04)
Herfindahl Index × Positive surprise			-0.026*	-0.009
			(-1.93)	(-0.71)
Herfindahl Index × Forecast error				1.917**
				(2.48)
Herfindahl Index × Forecast error × Positive surprise				4.454**
				(2.06)
Forecast error		0.308***		0.178***
		(12.28)		(3.52)
Dispersion		0.272***		0.299***
		(3.93)		(4.35)
Size		-0.008***		-0.008***
		(-24.34)		(-24.39)
Analyst following		0.007***		0.007***
		(11.00)		(10.92)
Leverage		-0.004**		-0.005**
		(-2.04)		(-2.45)
Turnover		0.006***		0.006***
		(22.53)		(22.85)
Volatility		0.012***		0.013***
		(5.35)		(6.22)
Age		-0.005***		-0.005***
		(-12.94)		(-13.25)
Positve surprise	-0.003***	0.006***	-0.003**	0.005**
	(-8.47)	(3.34)	(-2.96)	(3.08)
Control variables × Positive surprise	No	Yes	No	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
N	171,044	142,158	171,044	142,158
Adjusted-R^2	0.100	0.144	0.096	0.144

regression as well as a dummy variable for the sign of the earnings surprise which interacts with all independent variables. The coefficient of pricing power is still significantly negative at the 1% significance level for negative earnings surprises but indistinguishable from zero for positive earnings surprises at the 10% significance level. A potential explanation for this finding is that analysts' earnings forecasts are more positively biased for firms with less pricing power. As a result, investors could weigh negative earnings surprises of low pricing firms less strongly than positive earnings surprises. Similarly, investors attach significantly more weight to a given forecast error when pricing power is greater, and earnings are better than expected. A possible explanation for this phenomenon is that investors expect that earnings misses of high pricing power firms are more likely to be one-off events, whereas they expect that the future profitability of high pricing power firms will increase in line with the positive surprise. Hence, I find that the relationship between pricing power and absolute earnings announcement returns is dependent on the sign of earnings surprise and thus partly asymmetrical.

The analysis is repeated to examine the potential asymmetric relationship between industry concentration and earnings announcement returns. Absolute announcement returns are significantly negatively related to industry concentration for both positive and negative earnings surprises when industry concentration is the sole regressor, as presented in model 3. However, this effect is significantly stronger at the 10% significance level for positive earnings surprises than for negative earnings surprises. In model 4, the other control variables as well as a dummy for positive earnings surprises are included in the regression. The coefficient of industry concentration is still significantly negative at the 5% level, although there is no significant difference between positive and negative earnings surprises. On the other hand, the interaction effect between industry concentration and forecast errors is significantly positive for both positive and negative earnings surprises, but significantly stronger for positive earnings surprises. Thus, investors attach more weight to the size of the forecast error when firms operate in more concentrated industries and earnings are better than expected. A possible explanation for this effect is that due to greater price-setting abilities of monopolistic firms, investors expect positive earnings surprises to be more persistent than negative earnings surprises of monopolistic firms.

Overall, I find that stock price returns to earnings surprises are dependent on the sign of the earnings surprise and product market power. Pricing power has a greater influence on absolute earnings announcement returns following negative earnings surprises than following positive earnings surprises. Moreover, investors attach more weight to the size of the positive earnings surprise for firms with more product market power. Hence, I accept hypothesis 4 and find that investor respond differently to positive and negative earnings surprises in combination with product market power.

6.5 Changes over time

Grullon, Larkin and Michaely (2018) find that over 75% of U.S. industries have become more concentrated between 1997 and 2012 and suggest that product market competition in the U.S. is structurally weakened. Therefore, I examine whether the relationship between product market power, analysts' forecasts, and earnings announcements returns has changed over time. To that end, I split the sample in three 10-year periods, 1986 – 1995, 1996 – 2005 and 2006 – 2015. Regression results are reported in table 11. In model 1, the Lerner Index is regressed on analyst forecast accuracy with dummy variables for the respective periods. I find that pricing power has a significant positive relationship with analyst forecast accuracy during all three periods. However, pricing power was significantly stronger related to forecast accuracy between 1986 and 1995 than in the two subsequent decades. Likewise, analyst forecast accuracy was significantly stronger related to pricing power between 1996 and 2005 than in the last 10 years of the sample. Hence, I find that the impact of the Lerner Index on analyst forecast accuracy has decreased over the past 30 years, implying that analyst learning based on a firm's pricing power has become less important. Nevertheless, the overall conclusion that pricing power is positively related to forecast accuracy remains unchanged over the sample period. Similarly, in model 2, the Herfindahl Index is regressed on analyst forecast accuracy with dummy variables for the respective periods. However, for industry concentration I find that the relationship between forecast accuracy and market power is negative in all 10-year periods and has not changed significantly.

In the same way, in model 3, the Lerner Index is regressed on analyst forecast dispersion with dummies for the three different sample periods. I find that relationship between analyst forecast dispersion and pricing power is less strong in the last 20 years of the sample compared to the first 10 years. Likewise, the relationship between industry concentration and analyst forecast dispersion was significantly smaller between 1996 and 2015 than in the 10-year period before that. Results are reported in model 4. This implies that the impact of product market power on analyst disagreement has decreased over time. Nonetheless, forecast dispersion is negatively related to pricing power and positively related to industry concentration in all three 10-year periods.

Table 11

Changes over time. This table reports regressions on the relationship between product market power, analyst forecast accuracy, analyst forecast dispersion and earnings announcement returns over time. The sample consists of firms which are followed by at least two analysts in the I/B/E/S database and with financial information in the CRSP/COMPUSTAT merged database in the period 1986 - 2015. The dependent variable is *analyst forecast accuracy* in model 1 and 2, *analyst forecast dispersion* in model 3 and 4, and the *5-day abnormal absolute announcement return* in model 5 and 6. The sample is split up in three periods: period 1 from 1986-1995, period 2 from 1996-2005, and period 3 from 2006-2015. *Lerner Index* is constructed as the difference between the firm's Lerner Index and the average Lerner Index of the two-digit SIC industry. *Herfindahl Index* is the squared sum of market share of firm sales within a SIC/NAICS industry. *Forecast error* is the absolute difference between analyst consensus quarterly EPS forecast and the firm's actual quarterly EPS, standardized by the stock price on the trading day preceding the forecast date. *Dispersion* is measured as the standard deviation of all earnings forecasts for a firm in a quarter divided by the stock price on the trading day preceding the forecast date. *Size* is a firm's market capitalization in millions of USD in the quarter before the earnings announcement. *Analyst coverage* is the natural logarithm of the number of analysts covering a firm in a quarter. *Leverage* is total long-term debt divided by total assets, weighted by firm total assets. *Turnover* is defined as the natural logarithm of the dollar volume of shares traded divided by the number of shares outstanding in the quarter. *Volatility* is the natural logarithm of historical volatility of profitability, measured as one plus the standard deviation of quarterly return on equity over the preceding three years. *Age* is the natural logarithm of the number of years a firm has been listed on CRSP. Industry-fixed effects are included in the model. Standard errors are clustered by firm. Absolute values of t-statistics are displayed in parentheses, below the coefficient estimates. The symbols ***, **, and * denote significance at the 1%, 5% and 10% levels respectively, for the two-tailed hypothesis test that the coefficient equals zero.

Variable	Forecast Accuracy		Forecast Dispersion		Announcement Returns	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Lerner Index	0.008***		-0.003***		-0.002	
	(7.15)		(-9.88)		(-1.12)	
Lerner Index × Period 2	-0.004***		0.001***		0.000	
	(-3.45)		(2.76)		(-0.09)	
Lerner Index × Period 3	-0.007***		0.001***		0.000	
	(-5.74)		(4.25)		(-0.07)	
Herfindahl Index		-0.023***		0.009***		-0.002
		(-3.79)		(4.08)		(-0.12)
Herfindahl Index × Period 2		0.009		-0.004*		-0.024
		(1.35)		(-1.87)		(-1.32)
Herfindahl Index × Period 3		0.013		-0.005		-0.036*
		(1.54)		(-1.39)		(-1.85)
Size	0.003***	0.004***	-0.001***	-0.001***	-0.005***	-0.005***
	(19.73)	(20.75)	(-19.73)	(-20.81)	(-13.68)	(-13.76)
Analyst following	-0.002***	-0.002***	0.001***	0.001***	0.005***	0.005***
	(-8.33)	(-8.14)	(9.98)	(9.71)	(7.33)	(7.29)
Leverage	-0.009***	-0.008***	0.004***	0.004***	-0.013***	-0.013***
	(-7.51)	(-6.85)	(9.54)	(8.80)	(-6.01)	(-6.07)
Turnover	0.000**	0.000	0.000*	0.000	0.004***	0.004***
	(2.50)	(1.32)	(-1.72)	(-0.74)	(12.65)	(12.79)
Volatility	-0.010***	-0.011***	0.004***	0.005***	0.013***	0.013***
	(-4.26)	(-4.62)	(5.46)	(5.73)	(3.63)	(3.65)
Age	-0.001***	-0.001***	0.001***	0.001***	-0.006***	-0.006***
	(-7.83)	(-7.89)	(9.14)	(9.04)	(-14.00)	(-13.97)
Forecast error					0.293***	0.293***
					(8.34)	(3.75)
Forecast error × Lerner Index					0.043	
					(0.49)	
Forecast error × Lerner Index × Period 2					0.064	
					(0.66)	
Forecast error × Lerner Index × Period 3					0.144	
					(1.55)	
Forecast error × Herfindahl Index						-0.066
						(-0.06)
Forecast error × Herfindahl Index × Period 2						1.735
						(1.23)
Forecast error × Herfindahl Index × Period 3						6.586***
						(3.82)
Dispersion					0.421***	0.429***
					(4.78)	(4.89)
Period 2	0.005	0.003	-0.001	0.000	0.013	0.016
	(1.14)	(0.74)	(-0.57)	(-0.01)	(0.73)	(1.00)
Period 3	-0.006***	-0.006***	0.004***	0.005***	0.052***	0.055***
	(-4.04)	(-4.10)	(8.57)	(9.48)	(12.67)	(13.18)
Control variables × Period 2	Yes	Yes	Yes	Yes	Yes	Yes
Control variables × Period 3	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	158,821	158,821	158,821	158,821	158,687	158,687
Adjusted-R^2	0.176	0.165	0.244	0.225	0.118	0.118

Regressions on the relationship between absolute earnings announcement returns and pricing power or industry concentration are reported in model 5 and 6. I find that between 1986 and 1995 there was no significant relationship between market power and announcement returns. Only in the last two decades of the sample the relationship was significantly negative. Similarly, I find no significant relationship between product market power and forecast errors in the first 10-year period, but a significant positive one, at a minimum of the 10% significance level, in the later periods. Hence, the finding that investors respond less strongly and attach more weight to earnings announcements of high market power firms coincides with product market becoming more concentrated and less competitive.

Overall, these results suggest that analyst and investor learning about firm profitability based on a firm's market power has changed somewhat over time. I leave to future research to determine what factors related to the structural change in U.S. product market competition affect the weakened relationship between product market power and analysts' earnings forecasts and the strengthened relationship between market power and absolute earnings announcement returns.

7. Conclusions

My thesis examines the link between product market power and analyst and investor learning about future firm profitability on a sample of U.S. firms from 1986 until 2015. My analysis establishes that product market power, which is proxied for by industry-adjusted pricing power and industry concentration, is a significant determinant of analysts' earnings forecast accuracy, analyst forecast dispersion and absolute earnings announcement returns.

I document that analysts are more accurate and disagree less in forecasting earnings of firms with more pricing power. This finding is consistent with the notion that high pricing power firms are better able to maintain profit margins when faced with exogenous cost shocks, leading to increased earnings predictability. On the other hand, my results show that analysts' forecast accuracy and analyst forecast dispersion are decreasing in the degree of industry concentration, whereas a positive relationship was hypothesized. A possible explanation for this result is that firms in more concentrated industries make less information on their operations publicly available in order to protect their competitive advantage. This results in an inferior information environment and forces analysts to make more assumptions in their earnings estimates. Thus, I find that analysts learn more about future firm profitability when a firm has greater pricing power and if it operates in a more fragmented industry. The economic impact of product market power on analysts' earnings forecasts is considerable, although greater for pricing power.

Furthermore, I find that absolute earnings announcement returns decrease in a firm's pricing power and the level of industry concentration. This result is consistent with the notion that more private information is included into stock prices of high market power firms. As a result, investors learn less from earnings announcements of high market power firms about future firm profitability, and absolute stock returns are smaller. The economic impact of pricing power on earnings announcement returns is considerable, while it is more limited for industry concentration. Moreover, the results show that investors respond more strongly to a given forecast error if a firm has more product market power. This is consistent with earnings announcements of high market power firms sending a stronger informational signal because earnings are more persistent.

Next to that, I document that investors respond asymmetrically to positive and negative earnings surprises given a firm's product market power. Pricing power has a greater influence on absolute earnings announcement returns following negative earnings surprises. A possible explanation for this finding is that analysts' earnings forecasts are more positively biased for firms with less pricing power. In addition, I find that investors attach significantly more weight to a given forecast error when market power is greater, and earnings are better than expected. A possible explanation is that investors expect earnings misses of high product market power firms to be one-off events, while they expect positive earnings surprises to be more persistent.

Additionally, I find that the relationship between product market power and analysts' earnings forecasts was significantly weaker between 1996 and 2015 than between 1986 and 1995, although still significant at the 10% significance level. This weakened relationship coincides with a period in which U.S. product markets have become substantially more concentrated and competition declined. On the other hand, the relationship between product market power and absolute earnings announcement returns was not significant between 1986 and 1995, but significantly positive in the 20 years after that. I leave to future research to determine what factors relating to the structual change in U.S. product market competition affect the relationship between product market power, analysts' earnings forecasts and absolute earnings announcement returns.

Potential limitations of this analysis include that regression variables are only proxies for 'true' effects. It is conceivable that the variables do not capture the full influence on product market power and analysts' earnings forecasts or earnings announcement returns as intended. Moreover, earnings announcements are not standardized events in terms of the historical information released and the forward-looking guidance given, as this differs by company. As a result, it is plausible that there are omitted variables that affect both analysts' earnings forecasts or earnings announcement returns and product market power which could lead to biased outcomes. Besides, the sample likely suffers from sample selection bias. Only publicly listed firms are included in the sample and these firms are not likely to be random selection of all firms. Next to that, the specification of the event window affects the significance and magnitude of regression results of product market power on earnings announcement returns, indicating that these findings are not very robust. Given these limitations, results should be interpreted with reasonable care.

The implications of these findings are multifold. Analyst recommendations are better for high pricing power firms and firms in more fragmented industries, as analysts learn more about their future firm profitability. Therefore, investors are advised to attach more weight to analysts' forecasts in these situations. This could arguably lead to improved stock selection by investors. Moreover, the potential of additional stock and industry research efforts by analysts or investors is likely to be greater when directed at low pricing power firms and concentrated industries. Furthermore, the research results of this study confirm that investors learn less from earnings announcements of low market power firms as stock prices of these firms tend to be more efficient. Additional research could look further into the combined effect of the sign of earnings surprises and product market power, including if this effect is persistent for a firm over multiple quarters or if investors and analysts learn from their over- or underestimating.

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