

Voluntary Disclosure Under Idiosyncratic Uncertainty

Qirong Song

Bayes Business School, City St George's, University of London, EC1Y 8TZ London, U.K.

Abstract

My research investigates the effect of firm-level idiosyncratic uncertainty on voluntary disclosure. Using a novel dataset of consumer transaction data to measure idiosyncratic uncertainty, this study finds that idiosyncratic uncertainty reduces managers' propensity to make voluntary capital expenditure forecasts and that the negative effect of idiosyncratic uncertainty on disclosures is weaker in periods of declining performance compared to growing performance. This study also shows that managers place more weight on their private information with an increase in idiosyncratic uncertainty and rely less on market signals, suggesting that they have more internal information under uncertainty in periods of declining performance. Additional analyses confirm this finding by showing that idiosyncratic uncertainty has a less negative impact on planned capital expenditures in periods of declining performance compared to periods of growing performance.

Keywords: Uncertainty, voluntary disclosure, CAPEX forecasts

I. INTRODUCTION

My research investigates the effect of firm-level idiosyncratic uncertainty on voluntary disclosure. This research question is motivated by the conflict managers face between the increasing demand for and the additional costs of voluntary disclosure when firm performance is volatile. Cukierman (1980) and Bernanke (1983) suggest that firm performance is an important information source and volatile firm performance creates uncertainty. Firm-level idiosyncratic uncertainty creates additional challenges for both firms' insiders' and outsiders' information collection. On the one hand, from the increasing information demand perspective, volatile firm performance may introduce market inefficiencies and thus managers' internal information is particularly important for investors' decision making under idiosyncratic uncertainty. For example, Maslar et al. (2021) suggests that managers have an information advantage over outsiders about the specific implications of macroeconomic uncertainty on firm performance. On the other hand, high idiosyncratic uncertainty makes it harder for managers to extract information from observing firm performance or to make voluntary disclosures thereby increasing their voluntary disclosure preparation costs. Unlike mandatory disclosure like earnings announcements, the timing and content of voluntary disclosure such as managerial capital expenditure forecasts are purely subject to managers' discretion. Therefore, during times of high idiosyncratic uncertainty, managers may reduce voluntary disclosure due to the lack of information, even though that is precisely the time when there is greater market demand for managers' internal information.

I first examine the impact of firm-level idiosyncratic uncertainty on the managers' propensity to make voluntary disclosure. Firm-level idiosyncratic uncertainty may impact voluntary disclosure via two channels: managers' additional costs to prepare disclosure and investors' increased demand for internal information. Particularly, higher idiosyncratic uncertainty makes it harder for managers to extract useful information from observing firm performance and to

prepare voluntary disclosures to reveal inside information to the market. Yet, volatile firm performance also creates additional challenges for investors' decision making and thus worsens adverse selection problems between the firm and new investors. In the presence of high idiosyncratic uncertainty, whether managers decide to make voluntary disclosure depends on the trade-off between increased disclosure preparation costs and increased adverse selection costs. If the increased disclosure preparation costs are lower (higher) than the increased adverse selection costs, then managers would decide (not) to make voluntary disclosure. Whether idiosyncratic uncertainty reduces the propensity to make voluntary issuance is therefore an open question.

For managers, significant components of the disclosure preparation costs include the information collection costs and the information collection benefits. To assess the benefits and costs, I therefore compare the impact of idiosyncratic uncertainty on voluntary disclosure during periods of growing firm performance and declining firm performance, because growing and declining firm performance result in different incremental costs and benefits of information collection. This is due to accounting conservatism in mandatory accounting standards, which results in lower incremental costs of information collection during periods of declining performance. Accounting conservatism requires firms to collect more information around bad news and bad news is more likely to occur during periods of declining firm performance compared to periods of growing firm performance. Therefore, information collection costs are likely to be lower during the former. In addition, loss-aversion suggests that the benefits of information collection are greater during periods of declining performance. Loss-aversion is defined as the tendency to prefer avoiding losses to acquiring equivalent gains (Köbberling & Wakker, 2005), and loss making is of higher probability during periods of declining firm performance compared to growing firm performance. The lower information collection costs due to accounting conservatism and greater information collection benefits due to loss-aversion

thus leads to lower information preparation costs during periods of declining performance. Therefore, my study predicts that managers are more likely to make voluntary disclosure under idiosyncratic uncertainty during periods of declining firm performance compared to periods of growing firm performance.

This study uses a novel dataset of daily consumer transactions to measure firm-level idiosyncratic uncertainty and managerial capex forecasts as a proxy for voluntary disclosure. A probit regression analysis of 1827 firm-year observations from 2016-2021 shows that idiosyncratic uncertainty is negatively associated with the propensity to make voluntary disclosure. The finding suggests that under higher idiosyncratic uncertainty, managers are less likely to make voluntary disclosures. I then divide the 1827 firm-year observations into periods of stable, declining, and growing firm performance according to the annual rate of change of a firm's individual consumers revenues. This analysis finds that idiosyncratic uncertainty has a negative impact on the propensity to make voluntary disclosure during periods of growing firm performance and that this negative association is weaker by approximately 86% during periods of declining performance. This finding is consistent with my prediction that, managers are more likely to make voluntary disclosures under high idiosyncratic uncertainty during periods of declining performance compared to periods of growing performance.

In order to understand whether managers make voluntary disclosure to mitigate adverse selection and resolve potential market inefficiencies created by volatile firm performance, one needs to distinguish between whether managers make voluntary disclosure to provide their internal information or to elicit market feedback. Particularly, I test, for firms that make voluntary disclosure (announcers) under high idiosyncratic uncertainty, whether these announcers rely more on their internal information or market signals (price information). Prior research suggests that managers reveal internal information to resolve investors' uncertainty (Rogers et al., 2009; Billings et al., 2015; Nagar et al., 2019; Barth, Landsman, Tian, et al.,

2020; Maslar et al., 2021). Recent empirical evidence, however, also documents that less-informed managers use voluntary disclosure to elicit market feedback and adjust their capex decisions by observing the market reaction to the disclosure (Jayaraman & Wu, 2020). It is hard to distinguish whether or not managers are informed before they make the disclosure. I, therefore, develop a hypothesis assuming that managers are informed and a competing hypothesis assuming that managers are less informed.

To examine whether announcers rely more on their internal information or market signals when issuing voluntary disclosure during under high idiosyncratic uncertainty, I estimate the moderating effect of idiosyncratic uncertainty on the association between the market reaction to manager's disclosure and their adjustments of actual capex relative to forecasted capex. Jayaraman and Wu (2020) show that the positive association between the market reaction and capex adjustment is stronger (weaker) when managers are less (more) informed. Using a sample of 1831 capex forecasts issued during 2016 to 2021, I find that firm performance uncertainty has a significant negative impact on the association between the market reaction to capex forecasts and managers' capex adjustments, indicating that managers place less (more) weight on market signals (their internal information) under higher idiosyncratic uncertainty.

Overall, this paper shows that 1) managers are more likely to make voluntary disclosures under high idiosyncratic uncertainty during periods of declining firm performance compared to periods of growing firm performance and 2) managers tend to rely more on their internal information when making these disclosures under high idiosyncratic uncertainty. These two findings together suggest that managers are more informed under idiosyncratic uncertainty during periods of declining firm performance compared to periods of growing firm performance. Therefore, I predict that managers tend to make more investments plans under high idiosyncratic uncertainty during periods of declining firm performance compared to periods of growing firm performance. To test this prediction, I estimate the impact of

idiosyncratic uncertainty on planned capex during periods of declining and growing firm performance. The additional results show that idiosyncratic uncertainty has a negative impact on planned capex during periods of growing firm performance but not during periods of declining firm performance. This finding is consistent with the prediction of my additional analysis and suggests that idiosyncratic uncertainty has a less negative impact on corporate investment plans during periods of declining firm performance compared to periods of growing firm performance.

My study offers several contributions to the extant literature on voluntary disclosure. First, my study contributes to the literature that examines the association between voluntary disclosure and uncertainty. Prior voluntary disclosure research shows that managers make voluntary disclosures to resolve the uncertainty faced by information users (Barth, Landsman, Tian, et al., 2020; Billings et al., 2015; Maslar et al., 2021; Nagar et al., 2019; Rogers et al., 2009). However, little is known about 1) whether managers continue to make voluntary disclosure when firm-level uncertainty is high and 2) whether these disclosures under uncertainty is to reveal internal information or just “cheap talk”. These two questions are important in order to understand the role of voluntary disclosure in preventing and/or resolving market inefficiencies created by information uncertainty. However, it is difficult to test these two questions without measures of firm-level uncertainty with sufficient frequency. With a novel dataset of firm real-time revenue based on consumer transactions, my study measures firm-level idiosyncratic uncertainty using real-time revenue volatility.

Second, my study also contributes to disclosure and corporate investment studies. There is a dearth of research examining the relationship between firm disclosures decision and investment decisions from the information perspective (Roychowdhury et al., 2019). Prior literature documents a positive association between disclosures and corporate investment decisions and suggests that this positive association indicates disclosures reduce information asymmetry and

improve capital supply (Jung et al., 2014; Leuz & Wysocki, 2016; Bae et al., 2017). Managers' information sets are an important alternative explanation for this positive association. Particularly, stable firm performance makes it easier for managers to extract useful information from observing firm performance and with this information managers are more likely to make voluntary disclosure and make investment decisions. My study shows that even if managers have more access to capital supplies during periods of growing firm performance compared to periods of declining firm performance, managers tend to reduce their investment plans more under high idiosyncratic uncertainty during periods of growing firm performance compared to periods of declining firm performance. This finding suggests that managers' information sets and capital supply together contribute to efficient corporate investments.

Lastly, this study contributes to the literature on managerial learning by showing that managers rely more on their internal information under idiosyncratic uncertainty. This is consistent with Maslar et al. (2021)'s proposition that managers have deeper insights into firm-specific performance. Maslar et al. (2021) use forecast accuracy as a proxy for managers' internal information. My study extends theirs by showing that the quantity of voluntary disclosure could also represent managers' internal information. My study also helps to address the concern that managers make voluntary disclosure under uncertainty to avoid the costs of non-disclosure. Empirical evidence shows that managers rely less on market signals indicating that capex forecasts issued under idiosyncratic uncertainty is to reveal internal information instead of cheap talk. This empirical evidence also contributes to the discussion about whether managers issue voluntary disclosure to prevent and/or resolve market inefficiencies created by volatile firm performance.

The remainder of this paper is organized as follows. Section II discusses relevant research and develops hypotheses. Section III develops the research design. Section IV describes the sample. Section V presents the empirical analysis results, and Section VI concludes the study.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

“(T)he marginal efficiency of capital depends not only on the existing abundance or scarcity of capital-goods and the current cost of production of capital-goods, but also on current expectations as to the future yield of capital-goods ... But, as we have seen, the basis for such expectations is very precious. Being based on shifting and unreliable evidence, they are subject to sudden and violent changes.”

Keynes, *The General Theory*, Ch.22

The assumption that managers are endowed with perfect information about firm performance is prevalent in voluntary disclosure studies (Rogers et al., 2009; Billings et al., 2015; Nagar et al., 2019; Barth, Landsman, Tian, et al., 2020; Maslar et al., 2021). Previous studies discussing the impact of uncertainty on voluntary disclosure assume that the uncertainty mainly introduces information shocks to outsiders, not managers. For example, Billings et al. (2015) find that increased abnormal stock price volatility is likely to lead managers to provide bundled voluntary disclosure to resolve investors' uncertainty. The assumption of this finding is that the stock price volatility is a shock to investors' information not to managers' information and that is why managers use voluntary disclosure as a tool to resolve investors' uncertainty. Maslar et al. (2021) recognise that uncertainty, as created by economic downturns, makes it harder for both managers and outsiders to forecast, but managers still have an information advantage to provide more accurate forecasts to outsiders. My study suggests that it is important to understand the impact of firm-level uncertainty on voluntary disclosure.

2.1 Idiosyncratic Uncertainty and Voluntary Disclosure

Uncertainty in this study refers to firm-level idiosyncratic uncertainty; therefore, the models of Cukierman (1980) and Bernanke (1983) are relevant because their models assume that information extracted from past firm performance makes the distribution of the future value of

a project less uncertain. In the settings of Cukierman (1980)'s model, investment decision-making is a process of picking investment projects from available projects to maximise payoffs. The return on each potential project is stochastic and depends on parameters W , whose exact values are usually unknown to the firm when it decides which project to undertake. Using a Bayesian framework, Cukierman (1980) proposes that the firm has a prior distribution on parameters W and can learn about its likely magnitude by observing the realizations, over time, of a certain firm performance random variable, x , whose distribution depends on W .

My study suggests that firm-level idiosyncratic uncertainty increases the preparation costs of disclosure. Particularly, stable firm performance makes it easier for managers to gauge parameters of future projects and provide useful information about investment plans to the market. In contrast, idiosyncratic uncertainty created by volatile firm performance makes it harder for managers to extract useful information from observing firm performance. Consequently, volatile firm performance will increase the costs of preparing voluntary disclosure.

Furthermore, idiosyncratic uncertainty increases the adverse selection costs of non-disclosure. Volatile firm performance also creates additional challenges for capital providers (shareholders, creditors, etc) to evaluate firm performance. Outsiders require firm disclosures to gauge the value of assets in place and of existing investment opportunities. Under volatile firm performance, the adverse selection problem between the firm and outsiders may be worsened without voluntary disclosure. Prior studies show that when investors' demand for voluntary disclosure is high, managers are more likely to issue voluntary disclosure to resolve adverse selection problems (Barth, Landsman, Tian, et al., 2020; Billings et al., 2015; Maslar et al., 2021; Nagar et al., 2019; Rogers et al., 2009).

In this study, I examine whether managers make voluntary disclosure to mitigate increased adverse selection costs when firm performance becomes volatile. Volatile firm performance results in an increase in disclosure preparation costs due to lack of information. If the increase in adverse selection costs is higher than the additional disclosure preparation costs, then managers will provide voluntary disclosure to resolve potential market inefficiencies of corporate valuation. If the increase in adverse selection costs is lower than the additional disclosure preparation costs, then managers may decide not to provide voluntary disclosures. Comparing adverse selection costs and disclosure preparation costs under idiosyncratic uncertainty ex ante is difficult given that both are generally unobservable. Whether managers will increase or decrease voluntary disclosure therefore remains an open question. My study tests the null hypothesis that there is no effect of idiosyncratic uncertainty on managers' propensity to make voluntary disclosures.

H1a: There is no impact of idiosyncratic uncertainty on the propensity of voluntary disclosure issuance.

Preparation Costs and Voluntary Disclosure

Disclosure preparation costs comprise of the information collection costs and the information collection benefits. Cukierman (1980) and Bernanke (1983) suggest that if a firm is allowed to collect information, then investment decision making under uncertainty would be a trade-off between the extra returns from early commitment and the benefits of increased information by waiting. Given that this study focuses more on the motivation of information collection instead of the timing of investment decisions, the trade-off faced by managers when they decide whether or not to collect information is between the incremental benefits from the information collected and the costs associated with the information collection process.

Accounting conservatism in mandatory reporting standards results in lower incremental information collection costs during periods of declining firm performance compared to

growing firm performance. This is because accounting conservatism requires managers to report bad news in a more timely manner; and therefore, managers collect more information around bad news compared to good news (Basu, 1997; Beaver et al., 2012; Barth, Landsman, Raval, et al., 2020). Shroff (2017) finds that accounting standards changes that require the managers to obtain more information are positively associated with a firm's investments even if some accounting standard changes do not impact the measurement and reporting process of the investment. My study suggests that the more rigorous requirement of bad news recognition leads managers to obtain more information for investment decision making. Moreover, bad news is more likely to occur during periods of declining firm performance compared to periods of growing firm performance. Therefore, accounting conservatism in mandatory reporting standards likely results in managers being more informed during periods of declining firm performance compared to periods of growing firm performance. Prior studies also suggest that managers use the same information set for disclosure and investment tasks (Goodman et al., 2014; Roychowdhury et al., 2019). Therefore, the incremental costs to collect information for investment plans is lower in during periods of declining firm performance compared to periods of growing firm performance.

Loss-aversion suggests that the incremental information collection benefits are higher during periods of declining firm performance compared to periods of growing firm performance. Loss-aversion is defined as the tendency to prefer avoiding losses compared to acquire equivalent gains (Tversky & Kahneman, 1991; Köbberling & Wakker, 2005). Prior research suggests that loss-aversion is prevalent among managers (Willman et al., 2002; Haigh & List, 2005). Given that loss making is of higher probability during periods of declining firm performance compared to periods of growing firm performance, the incremental information collection benefits are higher during periods of declining firm performance.

In summary, accounting conservatism suggests that incremental information collection costs during periods of declining firm performance are lower. At the same time, loss-aversion suggests that incremental information collection benefits are higher during periods of declining firm performance. Thus, the disclosure preparation costs are lower during periods of declining firm performance. The study assumes that the adverse selection costs of non-disclosure does not vary between periods of declining and growing firm performance. Consequently, I predict that managers are more likely to make voluntary disclosures under high idiosyncratic uncertainty during periods of declining performance, where the disclosure preparation costs are lower.

H1b: Managers are more likely to make voluntary disclosures when idiosyncratic uncertainty is high during periods of declining firm performance compared to periods of growing firm performance.

2.2 Reveal Private Information or Elicit Market Feedback

It is also important to distinguish whether managers make voluntary disclosures to reveal their inside information or whether they do so instead to elicit market feedback. Jayaraman and Wu (2020) show that managers use capex forecasts to elicit market feedback, which results in an increase in managerial information sets. Ali and Fan (2022) show that capex forecasts improve transparency, suggesting that managers reveal internal information via voluntary disclosure.

Maslar et al. (2021) find that managers' forecast accuracy improves under uncertainty created by economic downturns, suggesting that managers have higher quality information compared to outsiders during economic downturns and reveal their internal information via managerial forecasts. Jayaraman and Wu (2020) find a significant positive association between the market reaction to forecasts and managers' adjustments of actual capex relative to forecasted capex. Additionally, they find that this association between the market reaction and managers' adjustment becomes insignificant when managers are more informed. I, therefore, predict that

H2a: Managers' adjustments of actual capex relative to forecasted capex tend to react less to the market response to capex forecasts with an increase in idiosyncratic uncertainty.

Cukierman (1980)'s models suggest that volatile firm performance indicates weaker managerial information. Using insider trading as a proxy for managers' private information, Jayaraman and Wu (2020) find that managers adjust their actual capex relative to forecasted capex in accordance with market reaction when they are less informed. Therefore, the competing hypothesis predicts that

H2b: Managers' adjustments of actual capex relative to forecasted capex tend to react more to the market response to capex forecasts with an increase in idiosyncratic uncertainty.

III. RESEARCH DESIGN

3.1 Measure of Uncertainty

I use an anonymized dataset of European real-time consumer transaction data obtained from Fable Data to capture real-time firm performance. Each of the consumer transaction data includes information on transaction timing, merchant, and transaction amount. I aggregate all the transaction data to daily basis and then use the coefficient of variation of daily consumer transaction revenues to proxy for firm level idiosyncratic uncertainty. The first advantage of real-time consumer transaction data is that this data is free from accrual management and any other reporting manipulation. Another major advantage compared to quarterly or annual reported revenue data, is that the granularity of consumer transaction data enables intra-quarter and intra-year measurements of firm performance uncertainty. Similar consumer transaction dataset has been used to measure real-time revenue in Blankespoor et al. (2022)'s study, further confirming the value of consumer transaction data.

This real-time consumer transaction dataset has three main limitations. The first is that it includes individual consumers only. This limitation is less concerning for measures of performance uncertainty under the assumption that the majority of firm performance volatility

arises from individual transactions compared to contract sales. The second limitation is that the dataset is limited to European bank data only. However, as long as global market sales of the firms in my sample follow similar patterns in volatility, there is less of a concern of misestimating firm performance volatility. The third limitation is that firms included in my sample are mainly consumer-facing due to the nature of consumer transactions. Thus, my findings might not necessarily extend to other industries.

In my study, for the average firm, the consumer transaction revenue is 0.31% of the annual reported revenue for the same fiscal year. While this is a small fraction of reported revenues, the correlation between consumer transaction revenue and reported annual revenue in my study is 38% (significant at 1%). Additionally, annual consumer transaction revenues variance explains 49% of the reported annual revenue variance, verifying the credibility of consumer transaction data in measuring firm performance volatility.

To measure idiosyncratic uncertainty ($Uncertainty_{i,t}$), my study uses the coefficient of variation of daily consumer transaction revenue. To estimate daily consumer transaction revenue, I aggregate the consumer transaction data on a daily basis. The coefficient of variation is the standard deviation of daily consumer transaction revenue scaled by the value of the mean for firm i during fiscal year t (see Equation (1)). In Equation (1), $\sigma_{i,t}$ is the standard deviation of daily consumer transaction revenues measured for firm i during the fiscal year of t , and $\mu_{i,t}$ is the mean value of daily consumer transaction revenue measured for firm i during the fiscal year of t .

$$Uncertainty_{i,t} = \frac{\sigma_{i,t}}{\mu_{i,t}}, (1)$$

3.2 Periods of Growing, Stable, and Declining Performance

All firm-year observations are divided into three categories, periods of growing firm performance, periods of declining performance, and periods of stable performance. Firm

performance is measured by the rate of change of annual consumer transaction revenue as in Equation (2).

$$\delta_{i,t} = \frac{\sum x_{i,t} - \sum x_{i,t-1}}{\sum x_{i,t-1}}, (2)$$

where $\delta_{i,t}$ is the rate of change for firm i in fiscal year t , and x is daily revenues. I then rank the $\delta_{i,t}$ cross-sectionally. Firm-years with $\delta_{i,t}$ within the top quartile of all $\delta_{i,t}$ are defined as periods of growing firm performance. Firm-years with $\delta_{i,t}$ in the bottom quartile of all $\delta_{i,t}$ are defined as periods of declining firm performance. All remaining firm-year observations are categorized as periods of stable firm performance.

3.3 Idiosyncratic Uncertainty and Voluntary Disclosure

To test the impact of idiosyncratic uncertainty on voluntary disclosure (H1a), this study estimates the probit regression in Equation (3).

$$CAPEX_Forecast_{i,t} = \beta_1 Uncertainty_Decile_Score_{i,t} + \beta_2 Growth_{i,t} + \beta_3 Decline_{i,t} + Controls_{i,t} (3)$$

$CAPEX_Forecast_{i,t}$ is an indicator variable that equals to 1 if firm i issues capex forecasts during fiscal year t . $Uncertainty_Decile_Score_{i,t}$ is the annually cross-sectional decile rank of idiosyncratic uncertainty divided by 10. The $Uncertainty_Decile_Score_{i,t}$ ranges from zero to one. Increasing uncertainty creates an additional cost for managers to extract information from observing past firm performance and increasing adverse selection costs. If the additional information preparation costs are higher than the additional adverse selection costs, then managers will decide not to issue capex forecasts and β_1 will be negative. In contrast, if managers decide to issue capex forecasts β_1 will be positive.

I control for firm performance in estimating Equation (3). $Growth_{i,t}$ is an indicator variable equal to one for firm years in periods of growing firm performance and $Decline_{i,t}$ is an

indicator variable equal to one for firm years within periods of declining firm performance. Equation (3) also includes the following variables as controls. *Announcer_Lag* is an indicator variable if firm *i* issues capex forecasts during fiscal year *t*-1; *Assets* measures firm size as the natural logarithm of total assets; *Tobin_Q* measures growth opportunities; *Debt* measures the leverage ratio as total debt scaled by total assets which proxies for financial constraints. *Beta_RSQUARE* is the R-squared of the regression of individual stock returns on market returns over two years up to the beginning date of the fiscal year. A higher co-movement of the firm's stock return with the market indicates whether the firm is a bellwether firm; *ROA* is the ratio of net income to total assets and measures profitability. I also control for the country and fiscal year fixed effects in Equation (3). Standard errors are clustered by firm and fiscal year.

Preparation Costs and Voluntary Disclosure

To test whether firm disclosure strategies under high idiosyncratic uncertainty are different during periods of growing and declining performance (H1b), this study estimates the probit regression Equation (4).

$$CAPEX_Forecast_{i,t} = \beta_1 Uncertainty_Decile_Score_{i,t} + \beta_2 Growth_{i,t} + \beta_3 Growth_{i,t} \times \\ Uncertainty_Decile_Score_{i,t} + \beta_4 Decline_{i,t} + \beta_5 Decline_{i,t} \times \\ Uncertainty_Decile_Score_{i,t} + Controls_{i,t} \quad (4)$$

CAPEX_Forecast_{i,t} is an indicator variable that equals to 1 if firm *i* issues capex forecasts during fiscal year *t*. *Uncertainty_Decile_Score_{i,t}* is the annually cross-sectional decile rank of idiosyncratic uncertainty divided by 10. *Growth_{i,t}* is an indicator variable equal to one for firm-years during periods of growing firm performance. *Decline_{i,t}* is an indicator variable equal to one for firm-years during periods of declining firm performance.

In Equation (4), the coefficient of *Uncertainty_Decile_Score_{i,t}* (β_1) reflects the impact of idiosyncratic uncertainty on the propensity to make capex forecasts during periods of stable

firm performance. The coefficient of the interaction term $Growth_{i,t} \times Uncertainty_Decile_Score_{i,t}$ measures any incremental effect of idiosyncratic uncertainty on the propensity to make capex forecasts during periods of growing firm performance. The coefficient of interaction term $Decline_{i,t} \times Uncertainty_Decile_Score_{i,t}$ measures the incremental effect of idiosyncratic uncertainty on the propensity to make capex forecasts during periods of declining firm performance. I predict that information preparation costs, which is defined as information collection costs minus information collection benefits, are lower during periods of declining firm performance. Therefore, I predict that $\beta_5 > \beta_3$ in Equation (4).

Equation (4) includes the following variables as controls. *Announcer_Lag* is an indicator variable if firm *i* issues capex forecasts during fiscal year *t*-1; *Assets* measures firm size as the natural logarithm of total assets; *Tobin_Q* measures growth opportunities; *Debt* measures the leverage ratio as total debt scaled by total assets which proxies for financial constraints. *Beta_RSQUARE* is the R-squared of the regression of individual stock returns on market returns over two years up to the beginning date of the fiscal year. A higher co-movement of the firm's stock return with the market indicates whether the firm is a bellwether firm; *ROA* is the ratio of net income to total assets and measures profitability. I also control for the country and fiscal year fixed effects for Equation (4). Standard errors are clustered by firm and fiscal year.

3.4 Reveal Private Information or Elicit Market Feedback

It is important to understand whether managers make capex forecasts under high idiosyncratic uncertainty to reveal inside information (H2a) or to elicit market feedback (H2b). The null hypothesis (H2a) is that managers place more weight on their internal information with increasing idiosyncratic uncertainty and the competing hypothesis (H2b) is that managers place more weight on make signals when issuing capex forecasts under increasing idiosyncratic uncertainty. To test the null and competing hypothesis, I estimate Equation (5),

$$CAPEX_Forecasts_Adjust_{n,i,t} = \beta_1 Uncertainty_Decile_Score_{i,t} + \beta_2 CAR_{n,i,t} + \beta_3 Uncertainty_Decile_Score_{i,t} \times CAR_{j,i,t} + Controls_{i,t} \quad (5)$$

$CAPEX_Forecasts_Adjust_{n,i,t}$ is the percentage adjustment of actual capex from forecasted capex scaled by the latter, for CAPEX forecast n issued by firm i during fiscal year t . Following Jayaraman and Wu (2020), I use the difference between actual capex and endpoints of range forecasts to be conservative. Specifically, for actual capex that falls within the capex forecast range, I assign the adjustment to be zero. For actual capex lower than the lower end of the range forecast, I calculate the difference using the lower endpoint of the range. For actual capex higher than the higher end of the range forecast, I calculate the difference using the higher endpoint of the range.

$Uncertainty_Decile_Score_{i,t}$ is the annually cross-sectional decile rank of idiosyncratic uncertainty divided by 10. $CAR_{n,i,t}$ is the cumulative abnormal return during three days window centred around the announcement date of capex forecast n . Consistent with Jayaraman and Wu (2020)'s findings, I predict the coefficient of $CAR_{n,i,t}$ (β_2) to be positive. The coefficient of interaction term $Uncertainty_Decile_Score_{i,t} \times CAR_{j,i,t}$ (β_3) is predicted to be to be negative if managers place more weight on their internal information (H2a) and positive if managers place more weight on market feedback under increasing idiosyncratic uncertainty (H2b).

Controls include the following variables: *Bundle* is an indicator variable that equals to one if the capex announcement is issued together with a quarterly earnings announcement. *Surp* is earnings surprise as percentage of actual earnings per share. *Assets* is the natural logarithm of total assets; *Debts* as the total debts scaled by total assets to control for the effect of creditors' pressure on managers (Ali & Fan, 2022); *Lag_CAPEX* measures the natural logarithm of capex in the last fiscal year; *Beta_RSQUARE* is the R-squared of the regression of individual stock

returns on market returns over two years up to the beginning date of the fiscal year. *ROA* is the ratio of net income to total assets and measures profitability. I also control for the firm and fiscal year fixed effects for Equation (5). Standard errors are clustered by firm and fiscal year.

IV. SAMPLE AND DESCRIPTIVE STATISTICS

I use anonymized consumer transaction data from 2016-2021 to measure firm-level idiosyncratic uncertainty. To exclude the situations of extreme firm performance growth due to recent inclusion in the database, I exclude firms-years in the largest 0.5 percent of the rate of change of the annual consumer transaction revenue. I then match the consumer transaction data with Compustat and CRSP. I obtain capex forecasts information from I/B/E/S. The final sample comprises 323 firms, 1827 capex forecasts, 1827 firm-year observations from 2016-2021.

The breakdown of firm-year observations by fiscal year, country, and Fama French 48 industry is provided in Table 1. The breakdown of firm-year observations by fiscal-year shows that no specific fiscal year is dominating in my sample. To control for the time-varying trend of voluntary disclosure, I include fiscal-year as fixed effect in my following multivariate analysis. The breakdown of firm-year observations by country indicate that the majority of my sample are firms reported to Securities and Exchanges Commission (SEC) in the US (52.27%) and Financial Conduct Authority (FCA) in the UK (29.83%). Capex forecasts are not regulated by neither of these two regulators and other authorities in the remaining countries in my sample, verifying the voluntary nature of capex forecasts in my study. To control for differences in regulations across countries, I include country as a fixed effect in my following multivariate analysis. In Table 1 also provides a breakdown of firm-years by Fama French 48 industry. 21.29% firm-year observations are from retailing industry, followed by transportation (17.41%), and restaurants, hotels, and motels (10.13%). The breakdown of industry confirms

that by design of the consumer transaction data, the sample in my study are consumer-facing and thus I do not control for industry fixed effect in my study.

[Table 1]

Table 2 presents descriptive statistics for the key variables used in estimating Equations (3), (4) and (5). The mean value of *Uncertainty* measured as the variation of coefficient is 1.279 (t-statistic = 29.069). Given that variation of coefficient is standard deviation scaled by mean value, the mean value of uncertainty in my study suggests that on average the standard deviation of daily revenues is larger than the mean value of daily revenues on average and firm performance volatility measured by daily consumer revenues has economic significance. Table 2 shows that the mean value of *Rate of Change of Firm Performance* is not significantly different from zero (t-statistic = 1.775), suggesting my sample firm-year observations are not dominated by periods of growing performance or declining performance. The mean value of *Capex Forecasts Frequencies* is 0.994 (t-statistic = 23.101), suggesting that on average, each firm issue 0.994 capex forecasts during a year. However, the median value of *Capex Forecasts Frequencies* is 0, indicating that the mean value could be significantly influenced by a small number of firms make multiple capex forecasts. Thus, instead of using the value of *Capex Forecasts Frequencies*, my study uses an indicator variable of whether managers make capex forecasts as a dependent variable in my following multivariate probit regression. Table 2 shows that the *CAPEX_Adjustment* is not significantly different from zero (t-statistic = -0.471), verifying that my sample of capex forecasts is not dominated by opportunistic or pessimistic forecasts. The CAR is not significantly different from zero (t-statistic = -0.238), verifying that my sample is not dominated by any specific investors' preferences.

[Table 2]

Table 3 presents Pearson correlations between the key variables. Table 3a shows that the correlation coefficient between *Uncertainty* and *Rate of Change of Firm Performance* is insignificant, suggesting that volatile firm performance is not associated with declining firm performance. Table 3a also shows that *Uncertainty* is significantly negatively associated with *Capex Forecasts Frequencies*. The significant negative correlation coefficient suggests that with the increase in idiosyncratic uncertainty, managers tend to make fewer capex forecasts. The probit regression in the Equation (3) will provide more robust empirical evidence on the impact of idiosyncratic uncertainty on capex forecasts issuance.

[Table 3]

V. RESULTS

5.1 Univariate Analysis

Table 4 provides a univariate analysis comparing the frequencies of capex forecasts under high and low idiosyncratic uncertainty during periods of growing firm performance, stable firm performance and declining firm performance. High uncertainty is defined as quartile of cross-sectional annual idiosyncratic uncertainty. Low uncertainty is defined as the bottom quartile of cross-sectional annual idiosyncratic uncertainty. The univariate analysis shows that there is a significant decrease in capex forecasts frequencies with the increase in idiosyncratic uncertainty during periods of growing and stable firm performance. During periods of declining firm performance, there is no significant difference in capex forecasts frequencies between firm years in the presence of high and low idiosyncratic uncertainty.

During periods of stable performance, the average firm-year capex forecasts decrease significantly (t-stat = -3.425) from 1.154 to 0.577. The decrease in capex forecasts frequencies with an increase in idiosyncratic uncertainty suggests that managers are less likely to issue capex forecasts with the increase in idiosyncratic uncertainty. During periods of growing

performance, the average firm-year capex forecasts decrease significantly (t-stat = -2.299) from 1.152 to 0.634 when idiosyncratic uncertainty increase from bottom quartile to top quartile. During periods of declining performance, the average firm-year capex forecasts frequencies are not significantly different (t-stat = -1.142) under high and low idiosyncratic uncertainty. The significant decrease in capex forecasts with an increase in idiosyncratic uncertainty observed during periods of growing performance but not observed during periods of declining performance is consistent with my hypothesis H1b, showing that managers are more likely to issue capex forecasts with an increase in idiosyncratic risk during periods of declining performance compared to periods of growing performance. I will next test my first research question and the other hypotheses in a multivariate setting.

[Table 4]

5.2 Idiosyncratic Uncertainty and Voluntary Disclosure

To test the impact of idiosyncratic uncertainty on the propensity to make capex forecasts (H1a), I estimate Equation (3). Table 5 presents the regression results. The coefficient of *Uncertainty_Decile_Score* (β_1) is significantly negative at -0.321 (t-stat = -2.169). The significant negative coefficient suggests that an increase in idiosyncratic uncertainty leads to a decrease in the propensity to make capex forecasts.

[Table 5]

Preparation Costs and Voluntary Disclosure

To further understand the different impact of idiosyncratic uncertainty on the propensity to make capex forecasts during periods of growing and declining firm performance (H1b), I estimate Equation (4). The regression results are presented in Table 6. Table 6 shows that with increasing idiosyncratic uncertainty, managers are less likely to issue capex forecasts. Table 6 shows that this negative impact of uncertainty on capex is lower during periods of declining

performance. The key finding is consistent with the hypothesis H1b that managers are more likely to issue capex forecasts with an increase in idiosyncratic uncertainty during periods of declining firm performance compared to periods of growing firm performance.

Particularly, Table 6 shows that the *Uncertainty_Decile_Score* coefficient (β_1) is significantly negative at -0.570 (t-stat = -2.240), suggesting that during periods of stable firm performance in the presence of high idiosyncratic uncertainty, managers are less likely to issue capex. The coefficient on the interaction term *Growth x Uncertainty_Decile_Score* (β_3) is insignificant (t-stat = 0.815), suggesting that the negative impact of uncertainty on issuing capex forecasts is similar during periods of growing performance and periods of stable performance. The coefficient on the interaction term *Decline x Uncertainty_Decile_Score* (β_5) is significantly positive. Specifically, the coefficient (t-statistic) of β_5 is 0.500 (2.763). This finding suggests that the negative impact of uncertainty on issuing capex forecasts is mitigated by 88% (0.500/0.570) during periods of declining performance compared to periods of stable performance. The findings that β_3 is not significantly different from zero and β_5 is significantly positive are consistent with my prediction (H1b) that managers are more likely to issue capex forecasts with an increase in idiosyncratic uncertainty during periods of declining performance compared to growing performance.

[Table 6]

5.3 Reveal Private Information or Elicit Market Feedback

To understand whether managers make capex forecasts under increasing idiosyncratic uncertainty to reveal their inside information or it is to elicit market feedback, I estimate Equation (5) using 1831 capex forecasts during fiscal years 2016-2021. Table 7 presents the regression results. Consistent with Jayaraman and Wu (2020), I find that managers adjust actual capex relative to forecasted capex in accordance with the market feedback to the capex

forecasts. The key variable of interest is the interaction term *Uncertainty_Decile_Score* x *CAR*. Table 7 shows that the interaction term coefficient (β_3) is significantly negative (-1.247 with a t-statistic -2.938). This finding is consistent with the null hypothesis that managers place more (less) weights on internal information (market signals) under increasing idiosyncratic uncertainty.

[Table 7]

5.4 Additional Analysis - Impact on CAPEX decisions

Thus far the study shows that 1) managers are more likely to issue voluntary disclosure with increasing idiosyncratic uncertainty during periods of declining firm performance compared to periods of growing firm performance and 2) managers tend to rely more on their internal information when making voluntary disclosure under high idiosyncratic uncertainty. These two findings together suggest that managers are more informed under increasing idiosyncratic uncertainty during periods of declining firm performance compared to periods of growing firm performance. Given that managers need information to prepare investment plans, I predict that managers tend to make more investments plans under increasing idiosyncratic uncertainty during periods of declining firm performance compared to periods of increasing firm performance. To test this prediction, I estimate Equation (6) using 1002 firm-years during periods of growing and declining firm performance.

$$CAPEX_Planned_{i,t} = \beta_1 Uncertainty_Decile_Score_{i,t} + \beta_2 Decline_{i,t} + \beta_3 Decline_{i,t} \times Uncertainty_{i,t} + Controls_{i,t} \quad (6)$$

where *CAPEX_Planned* is forecasted capex value as a percentage of GrossPPE at the beginning of the period. *Uncertainty_Decile_Score* is the cross-sectional decile ranking of idiosyncratic uncertainty and then divided by 10. *Decline* is an indicator variable that equals to 1 if the firm-year observation has an annual rate of change of consumer transaction revenue within the

bottom quartile cross-sectionally. Given that sample for this additional analysis include firm-year observations during periods of growing and declining performance only, the coefficient of *Uncertainty_Decile_Score* (β_1) measures the impact of idiosyncratic uncertainty on planned capex value during periods of growing firm performance. The coefficient of interaction term *Decline x Uncertainty_Decile_Score* (β_3) measures the incremental effect of uncertainty on planned capex value during periods of declining firm performance compared to periods of growing firm performance.

The additional analysis predicts that idiosyncratic uncertainty has a negative effect ($\beta_1 < 0$) on planned capex value because managers have less information for investment decision making under high idiosyncratic uncertainty. Tables 6 and 7 together indicate that managers have more internal information under increasing idiosyncratic uncertainty during periods of declining firm performance compared to periods of growing firm performance; therefore, I predict that the coefficient of interaction term *Decline x Uncertainty_Decile_Score* is positive ($\beta_3 > 0$).

Controls include the following variables. *Lag_CAPEX* measures the natural logarithm of capex in the last fiscal year; *Assets* is the natural logarithm of total assets; *Tobin_Q* measures growth opportunities; *Debt* measures the leverage ratio as total debt scaled by total assets which proxies for financial constraints; *Beta_RSQUARE* is the R-squared of the regression of individual stock returns on market returns over two years up to the beginning date of the fiscal year; *ROA* is the ratio of net income to total assets and measures firm performance; *Cash*, is cash and cash equivalent as a percentage of total assets measuring capital supplies.

Table 8 shows the regression results of this additional analysis. Consistent with predictions, the coefficient of *Uncertainty_Decile_Score* (β_1) is significantly negative (-0.023, t-statistic = -2.501). The coefficient of *Decline x Uncertainty_Decile_Score* (β_3) is significantly positive (0.044, t-statistic = 2.796). β_3 , the positive incremental effect of idiosyncratic uncertainty

during periods of declining firm performance compared to periods of growing firm performance, is estimated to be approximately 100% of the negative impacts of uncertainty on planned capex value during periods of growing performance. This finding indicates that compared to periods of growing firm performance, idiosyncratic uncertainty almost has no significant impact on planned capex, which is consistent with the prediction in the additional analysis. Additional results in Table 8 confirm the findings in Tables 6 and 7 that managers have more information under uncertainty during periods of declining performance. Furthermore, the findings suggest that managers are able to make more investment plans despite of increases in idiosyncratic uncertainty.

[Table 8]

The significant negative coefficient of *Uncertainty_Decile_Score* (β_1) (t-statistic = -2.501) suggests that managers tend to make fewer investments due to lack of information in the presence of idiosyncratic risk. Given that the expected future payoffs of investment projects are higher during periods of growing firm performance compared to periods of declining performance, the finding of the additional analysis indicates the potential profitable investment opportunities foregone due to lack of information during periods of growing firm performance.

The coefficient of *Decline* (β_2) is significantly negative (t- statistic = -3.221), suggesting that compared to periods of growing performance, managers tend to make fewer investment plans during periods of declining performance. This finding could be explained by less access to capital supply and less profitable investment opportunities during periods of declining performance. The significant positive coefficient of *Decline x Uncertainty_Decile_Score* (β_3) emphasises the importance of information in investment decision making.

VI. CONCLUSION

This study investigates the impact of firm-level idiosyncratic uncertainty on voluntary disclosure. Particularly, this study provides answers to the following two questions. First, what is the impact of increasing idiosyncratic uncertainty on voluntary disclosure? Second, when managers make voluntary disclosures during high idiosyncratic uncertainty, do they rely more on internal information or market signals? The findings in this study provides insights into the conflicts between the increasing demand for and additional costs of voluntary disclosure when firm performance is volatile.

My study uses a novel dataset of consumer transaction data to measure intra-year idiosyncratic uncertainty. The findings are as follows. First, managers are less likely to make capex forecasts under high idiosyncratic uncertainty. Moreover, the probit regression analysis shows that the negative impact of idiosyncratic uncertainty on voluntary disclosure is partially mitigated during periods of declining firm performance compared to periods of growing firm performance.

To understand whether managers make capex forecasts under increasing idiosyncratic uncertainty to reveal their inside information or to elicit market feedback instead, my study examines 1831 capex forecasts issued during the fiscal year of 2016-2021. The regression analysis shows that with high idiosyncratic uncertainty, managers tend to rely more on their internal information and rely less on market signals.

My findings suggest that managers are more likely to make voluntary disclosures with increasing idiosyncratic uncertainty during periods of declining firm performance compared to periods of growing firm performance and second, that managers tend to rely more on their internal information when issuing voluntary disclosure under increasing idiosyncratic uncertainty. These two findings together suggest that managers are more informed under

increasing idiosyncratic uncertainty during periods of declining firm performance compared to periods of growing firm performance. In an additional analysis, I find that, even if access to capital and profitable investment opportunities are lower during periods of declining performance, the additional internal information helps managers to make investment plans under high idiosyncratic uncertainty. The negative impact of uncertainty on planned capex during periods of growing firm performance indicate potential profitable investments foregone due to lack of information.

This paper contributes to the literature that examines voluntary disclosure and uncertainty. Prior literature examines the impact of uncertainty at information-user level and shows that an increase in uncertainty at information-user level would motivate more voluntary disclosure (Barth, Landsman, Tian, et al., 2020; Billings et al., 2015; Maslar et al., 2021; Nagar et al., 2019; Rogers et al., 2009). My research examines the impact of uncertainty at reporting entity level and shows that with the increase in idiosyncratic uncertainty, managers are less likely to issue voluntary disclosure due to a lack of information. Moreover, due to loss-aversion and accounting conservatism, managers are more motivated to collect information during periods of declining performance. Additionally, managers issue voluntary disclosure to reveal their private information to the market.

This paper also contributes to disclosure strategies and corporate investment studies by showing that managers' internal information is also an important channel for how disclosures improve investment decisions. Prior studies suggest that the positive association between voluntary disclosure and corporate investment is a result of better information environments and lower costs of capital (Jung et al., 2014; Leuz & Wysocki, 2016; Bae et al., 2017). This study provides an alternative explanation to this positive association. Particularly, my finding show that internal information could both increase voluntary disclosure and facilitate corporate investments.

Lastly, this paper contributes to the literature on managers' learning by showing that managers rely more on their private information with the increase of firm-specific uncertainty. This is consistent with the findings by Maslar et al. (2021) that managers' forecasts are more accurate and informative during an economic downturn. My study extends their findings by showing that managers also make more voluntary disclosure, suggesting that more internal information is released to the market.

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TABLES AND FIGURES

Table 1a: Sample Profile by Fiscal Year

This table shows the fiscal year profile of the 1827 firm-year sample.

Fiscal Year	Frequency	%
2016	291	15.93%
2017	303	16.58%
2018	310	16.97%
2019	313	17.13%
2020	309	16.91%
2021	301	16.48%
Total	1827	100.00%

Table 1b: Sample Profile by Country

This table shows the country profile of the 1827 firm-year sample.

Country	Frequency	%
US	955	52.27%
UK	545	29.83%
Germany	91	4.98%
French	67	3.67%
Spain	36	1.97%
Canada	25	1.37%
Italy	23	1.26%
Sweden	22	1.20%
Denmark	17	0.93%
Australia	11	0.60%
Hugary	10	0.55%
Switzerland	9	0.49%
Ireland	6	0.33%
South Africa	6	0.33%
Brazil	4	0.22%
Total	1827	100.00%

Table 1c: Sample Profile by Fama French 48 Industry

This table shows the Fama French 48 industry profile of the 1827 firm-year sample.

Fama French 48 Industry	Frequency	%
Retail	389	21.29%
Transportation	318	17.41%
Restaurants, Hotels, Motels	185	10.13%
Business Services	182	9.96%
Banking	96	5.25%
Entertainment	83	4.54%
Apparel	72	3.94%
Communication	65	3.56%
Insurance	58	3.17%
Petroleum and Natural Gas	54	2.96%
Utilities	48	2.63%
Trading	45	2.46%
Personal Services	36	1.97%
Wholesale	24	1.31%
Aircraft	23	1.26%
Automobiles and Trucks	20	1.09%
Consumer Goods	19	1.04%
Construction	18	0.99%
Almost Nothing	12	0.66%
Beer & Liquor	12	0.66%
Real Estate	11	0.60%
Healthcare	9	0.49%
Computers	6	0.33%
Electronic Equipment	6	0.33%
Printing and Publishing	6	0.33%
Candy & Soda	6	0.33%
Electrical Equipment	6	0.33%
Construction Materials	6	0.33%
Medical Equipment	6	0.33%
Recreation	6	0.33%
Total	1827	100.00%

Table 2: Descriptive Statistics of Key Variables

	Count	Mean	t statistic	Std. Dev.	Median
1827 Firm-Year Observations					
Uncertainty	1827	1.279	29.069	1.880	0.723
Rate of Change of Firm Performance	1827	0.258	1.775	6.212	0.828
CAPEX Forecasts Frequencies	1827	0.994	23.101	1.839	0.000
Announcer_Lag	1827	0.334	30.278	0.472	0.000
Assets	1827	9.028	177.023	2.180	8.974
Tobin_Q	1827	1.711	39.246	1.863	1.030
Debt	1827	0.324	55.782	0.249	0.298
Beta_RSQUARE	1827	0.220	52.313	0.180	0.178
ROA	1827	0.029	8.651	0.142	0.031
1831 Capex Forecasts					
CAPEX_Adjustment	1831	-0.021	-0.471	1.909	-0.095
Bundle	1831	0.771	78.409	0.421	1.000
Surp	1831	0.994	10.518	4.044	0.584
CAR	1831	0.000	-0.238	0.072	0.000
Lag_CAPEX	1831	0.057	68.123	0.036	0.053

Table 3a: Correlation Table of Key Variables for Probit Regression of Impact of Idiosyncratic Uncertainty on Capex Forecasts

	Uncertainty	Rate of Change of Firm Performance	CAPEX Forecasts Frequencies	Announcer_Lag	Size	Tobin_Q	Debt	Beta_RSQUARE	ROA
Uncertainty	1.0***								
Rate of Change of Firm Performance	-0.02	1.0***							
CAPEX Forecasts Frequencies	-0.11***	0	1.0***						
Announcer_Lag	-0.13***	-0.02	0.64***	1.0***					
Assets	-0.05**	-0.05**	0.11***	0.08***	1.0***				
Tobin_Q	-0.07***	0.06**	0.01	0.01	-0.25***	1.0***			
Debt	-0.03	-0.02	0.03	0.06**	-0.05*	0.08***	1.0***		
Beta_RSQUARE	-0.04*	-0.04*	0.05*	0.06**	0.48***	0.03	0.13***	1.0***	
ROA	-0.05*	0.04*	0.09***	0.11***	0.09***	0.19***	-0.25***	0	1.0***

* p<0.1; ** p <0.05; *** p <0.01

Table 3b: Correlation Table of Key Variables for Regression Analysis of the Moderating Effects of Idiosyncratic Uncertainty on the Association Between Capex Adjustment and Market Response

	Uncertainty	Capex_Adjustment	Bundle	Surp	CAR	Lag_Capex	Assets	Debt	Beta_RSQUARE	ROA
Uncertainty	1.0***									
Capex_Adjustment	0.08***	1.0***								
Bundle	0.01	-0.03	1.0***							
Surp	-0.05*	-0.01	0.13***	1.0***						
CAR	-0.03	-0.03	0	0	1.0***					
Lag_Capex	0.07***	0.2***	-0.04	0.02	-0.02	1.0***				
Assets	-0.14***	0.04*	0.02	-0.15***	-0.02	-0.03	1.0***			
Debt	-0.11***	0.05**	0.02	-0.05**	0.03	-0.21***	0.04*	1.0***		
Beta_RSQUARE	-0.07***	-0.02	0.06***	-0.14***	-0.02	-0.18***	0.46***	0.16***	1.0***	
ROA	0	-0.04*	0.04*	0.1***	0.02	0.05**	-0.23***	0.01	-0.08***	1.0***

* p<0.1; ** p <0.05; *** p <0.01

Table 4: Comparison of Annual Capex Forecasts Frequencies with the Presence of High and Low Uncertainty for Periods of Growing, Stable and Declining Performance from 2016 to 2021

High uncertainty is defined as top quartile of idiosyncratic uncertainty cross-sectionally, and low uncertainty is defined as bottom quartile of idiosyncratic uncertainty cross-sectionally. Annual Capex forecasts is the number of capex forecasts issued for a firm-year.

	Growing Performance		Stable Performance		Declining Performance	
	mean	n	mean	n	mean	n
High Uncertainty	0.634	104	0.577	174	0.715	156
Low Uncertainty	1.152	125	1.154	197	1.063	132
t statistic	-2.299 **		-3.425 ***		-1.142	
* p<0.1.						
** p <0.05.						
*** p <0.01						

Table 5: Idiosyncratic Uncertainty and Capex Forecasts from 2016 to 2021

This table provides probit regression summary of Equation (1) $CAPEX_Forecast_{i,t} = \beta_1 Uncertainty_Decile_Score_{i,t} + \beta_2 Growth_{i,t} + \beta_3 Decline_{i,t} + Controls_{i,t}$. Variable Definitions are in Appendix.

CAPEX Forecasts	
Uncertainty_Decile_Score	-0.321 * (-2.169)
Growth	0.032 (0.216)
Decline	-0.136 (-1.051)
Announcer_Lag	2.332 *** (20.567)
Assets	-0.005 (-0.117)
Tobin_Q	-0.063 ** (-3.756)
Debt	0.331 (1.485)
Beta_RSQUARE	-0.087 (-0.432)
ROA	1.589 ** (3.195)
Observations	1827
Pseudo R Squared	0.508
Fixed Effects	Country and Year
SE Cluster	Firm and Year

T-statistics are in parentheses.

* p<0.1.

** p <0.05.

*** p <0.01

Table 6: Idiosyncratic Uncertainty and Capex Forecasts During Periods of Growing and Declining Firm Performance from 2016 to 2021

This table provides probit regression summary of Equation (4) $CAPEX_Forecast_{i,t} = \beta_1 Uncertainty_Decile_Score_{i,t} + \beta_2 Growth_{i,t} + \beta_3 Growth_{i,t} \times Uncertainty_Decile_Score_{i,t} + \beta_4 Decline_{i,t} + \beta_5 Decline_{i,t} \times Uncertainty_Decile_Score_{i,t} + Controls_{i,t}$. Variable Definitions are in Appendix.

	CAPEX Forecasts
Uncertainty_Decile_Score	-0.570 * (-2.24)
Growth	-0.119 (-0.785)
Growth x Uncertainty_Decile_Score	0.428 (0.815)
Decline	-0.365 * (-2.51)
Decline x Uncertainty_Decile_Score	0.499 ** (2.763)
Announcer_Lag	2.339 *** (20.782)
Assets	-0.007 (-0.175)
Tobin_Q	-0.065 ** (-3.913)
Debt	0.331 (1.538)
Beta_RSQUARE	-0.059 (-0.285)
ROA	1.586 ** (3.145)
Observations	1827
Pseudo R Squared	0.508
Fixed Effects	Country and Year
SE Cluster	Firm and Year

T-statistics are in parentheses.

* p<0.1.

** p <0.05.

*** p <0.01

Table 7: The Moderating Effect of Idiosyncratic Uncertainty on the Association Between Capex Adjustment and Market Reaction from 2016 to 2021

This table provides regression summary of Equation (5) $CAPEX_Forecasts_Adjust_{n,i,t} = \beta_1 Uncertainty_Decile_Score_{i,t} + \beta_2 CAR_{n,i,t} + \beta_3 Uncertainty_Decile_Score_{i,t} \times CAR_{j,i,t} + Controls_{i,t}$. Variable Definitions are in Appendix.

	CAPEX_Adjustement
Uncertainty_Decile_Score	-0.138 (1.705)
CAR	0.455 * (2.305)
Uncertainty_Decile_Score x CAR	-1.247 ** (-2.938)
Bundle	0.026 * (0.227)
Surp	0.000 (0.124)
Assets	0.165 * (1.858)
Lag_CAPEX	-0.533 (-0.621)
Beta_RSQUARE	-0.094 (-0.74)
Debt	-0.133 (-1.215)
ROA	0.313 (1.305)
Observations	1831
Adjusted R-Square	0.336
Fixed Effects	Firm and Year
SE Cluster	Firm and Year

T-statistics are in parentheses.

* p<0.1.

** p <0.05.

*** p <0.01

Table 8: The Impact of Idiosyncratic Uncertainty on Planned Capex During Periods of Growing and Declining Firm Performance 2016 to 2021

This table provides regression summary of Equation (6) $CAPEX_Planned_{i,t} = \beta_1 Uncertainty_Decile_Score_{i,t} + \beta_2 Decline_{i,t} + \beta_3 Decline_{i,t} \times Uncertainty_{i,t} + Controls_{i,t}$. Variable Definitions are in Appendix.

	CAPEX_Forecasted
Uncertainty_Decile_Score	-0.023 * (-2.501)
Decline	-0.042 ** (-3.221)
Uncertainty_Decile_Score x Decline	0.044 ** (2.796)
Lag_CAPEX	-0.004 (-0.302)
Assets	-0.008 (-0.825)
Tobin_Q	0.0010 (0.513)
Debt	-0.002 (-0.09)
ROA	0.068 ** (2.842)
Cash	-0.08 (-1.558)
Observations	1002
Adjusted R-square	0.622
Fixed Effects	Country and Year
SE Cluster	Firm and Year

T-statistics are in parentheses.

* p<0.1.

** p <0.05.

*** p <0.01

APPENDICES

Appendix A: Variables Definition

Variables	Definition
Uncertainty	The coefficient of variation of daily consumer transaction revenue, i.e. standard deviation of daily consumer transaction revenue scaled by mean value over the year.
Uncertainty_Decile_Score	Cross sectional decile ranking of uncertainty and then divided by 10
Rate of Change of Firm Performance	Rate of change of annual consumer transaction revenue
Growth	Indicator variable equal to 1 if the firm years falls within top 25 percentile of rate of change of firm performance
Decline	Indicator variable equal to 1 if the firm years falls within bottom 25 percentile of rate of change of firm performance.
CAPEX_Forecasts	Indicator variable that equals to 1 if the firm issues a capex forecast
Announcer Lag	Indicator variable that equals to 1 if the firm issues a capex forecast in the previous fiscal year
Assets	Size, measured as natural logarithm of total assets
Tobin_Q	Growth opportunities, measured as market value scaled by total assets
Debt	Financial constraints, measured as total debts as percentage of total assets
Beta_RSQUARE	Bellwetheriness, measured as r square of 2 year regression of individual stock return over market return as the beginning date of the year
ROA	Firm performance, net income scaled by total assets
CAPEX_Adjustment	CAPEX revision, measured as the percentage deviation of actual capex from forecasted capex scaled by the latter
CAR	cumulative abnormal returns during 3 days window centered around CAPEX forecasts date
Bundle	Indicator variable equal to 1 if the capex forecasts is issued together with an earning announcement
Surp	Earnings surprise, calculated as the mean value of earnings surprise as percentage of actual earnings per share
Lag_CAPEX	Natural logarithm of capital expenditures in last year

Appendix B: Examples of Capex Forecasts

Tesco Plc, Oct 03, 2018

“...of the fiscal year 2019, capital expenditure for the year is now expected to be no more than GBP 1.2 billion. Going forward, the company expects annual capital expenditure to remain between GBP 1.1 billion and GBP 1.4 billion.”

(Source: Capital IQ)