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Abstract

This paper documents that both domestic and cross-country economic policy uncertainty have significant impacts on the behaviours of domestic analysts in the United Kingdom. Specifically, domestic economic policy uncertainty has significant negative impacts on analyst earnings forecast accuracy, dispersion, and both analyst recommendation upgrades and downgrades, whereas it has no significant impact on analyst coverage in the United Kingdom. An industry analysis shows that the effects of policy uncertainties on analyst behaviours vary across industries. Moreover, European and global economic policy uncertainty have similar cross-country impacts as U.K. policy uncertainty on analyst behaviours in the United Kingdom, whereas U.S. policy uncertainty exhibits different impacts. This study presents novel and comprehensive evidence of the impacts of policy uncertainty on an important information intermediary that has significant influences on capital market efficiency, providing practical implications for investors, analysts, corporate managers, and policy makers.

Keywords*:* Economic policy uncertainty; Analyst earnings forecast accuracy; Forecast dispersion; Analyst coverage; Analyst stock recommendations

1. Introduction

As information intermediaries, sell-side financial analysts play an important role in interpreting and transmitting valuable firm-level information on investment and financing decisions to external investors, thereby influencing the aggregate capital market. Research has documented various factors influencing financial analysts' performance, including heightened uncertainties. For example, Hope and Kang (2005) find that inflation and foreign exchange volatility compromise analysts' forecast accuracy in an international setting. Baloria and Mamo (2017) find that U.S. presidential election cycles negatively affect analyst earnings forecast accuracy but positively influence the forecast dispersion in the United States.

However, there has been a paucity of research investigating the systematic effects of macro uncertainty due to economic policies on the behaviours of financial analysts outside of the United States or the effects of cross-country macroeconomic policy uncertainty on the behaviours of domestic analysts. Because of the cross-country differences in capital market development and institutional quality (e.g., Stulz and Williamson, 2003), comprehensive tests in different settings are necessary to reach a universal argument that policy uncertainty has significant impacts on analysts. Moreover, motivated by existing studies on the cross-country spillover effect (e.g. Rapach, Strauss, and Zhou, 2013), along with the rapid global economic integration in recent decades, macro policy uncertainties in dominant countries and zones is expected to have a cross-country spillover effect on the capital market. Therefore, we address these issues by examining whether and how macro-level policy uncertainties in the United Kingdom, United States, Europe, and around the world affect the behaviours of sophisticated professional financial

analysts in the U.K. setting.

We adopt the latest economic policy uncertainty (EPU) index, developed by Baker, Bloom, and Davis (2016), to measure the U.K. economic policy uncertainty. The index incorporates an extensive range of uncertainty factors related to economic policies.[1] Compared to traditional measures of macro uncertainties such as inflation, exchange volatility, or presidential election cycles, the EPU index measures uncertainty in dimensions of the economy, markets, policies, and regulations, allowing for cross-sectional variations at various frequencies of annual, monthly, and daily indices (Brogaard and Detzel, 2015).

Our investigations generate a set of interesting findings. First, the U.K. economic policy uncertainty has a negative impact on analysts' earnings forecast accuracy, consistent with the U.S. findings in Baloria and Mamo (2017). Second, the U.K. economic policy uncertainty generates a negative impact on analysts' forecast dispersion. This indicates greater herding during times of policy uncertainty, consistent with Lin (2018), who finds that analysts' tendency to herd increases with aggregate uncertainty. Third, the numbers of stock recommendation upgrades and downgrades are negatively related to the U.K. economic policy uncertainty, suggesting that although analysts are less likely to upgrade firms at times of macro uncertainty because of concerns over unfavourable prospects, they are reluctant to downgrade firms during times of macro uncertainty. This is consistent with

[1] It is a measure of policy-related economy uncertainty, comprising newspaper coverage, temporary federal tax code provisions, and reported disagreements among economic forecasters. Half of the weightings this index uses are from the news-based policy uncertainty index (which is based on the frequency of uncertainty-related words in 10 leading U.K. newspapers), and the following three measures each contribute one sixth of the weightings: the temporary federal tax code index; forecast disagreement of the Consumer Price Index; and forecast disagreement of federal, state, and local purchases.

Hugon, Kumar, and Lin (2016), who observe that analysts underreact to negative macroeconomic news.

Furthermore, following Gulen and Ion (2016) and Baloria and Mamo (2017), we conduct an industry-level analysis to test whether firms in certain industries are more sensitive to policy uncertainty than firms in other industries. Naturally, if firms in some industries are more sensitive to policy uncertainty, then it is more challenging for analysts to forecast their results. We find that the impacts of U.K. economic policy uncertainty on analyst behaviours vary across industries.

Further, we analyse whether and how economic policy uncertainty in the United States, Europe, and across the globe affect analysts' behaviours in the United Kingdom. Our investigation reveals that European and the global economic uncertainties have similar impacts on analysts' behaviours in the United Kingdom, exerting negative influence on forecast accuracy, dispersion, recommendation upgrades and downgrades. However, U.S. policy uncertainty demonstrates a negative impact on forecast accuracy and recommendation upgrades but a positive impact on analyst coverage. Overall, we find cross-country effects of policy uncertainties on analysts' behaviours, indicating cross-country spillovers in terms of macro uncertainty.

This paper contributes to the literature in several important ways. First, it is the only investigation of the impact of macroeconomic policy uncertainty on analysts' behaviours in the United Kingdom, providing novel evidence beyond the U.S. setting. The U.K. market has some features in common with the U.S. market, upon which most research to date has concentrated, but the markets also have a number of differences. For example, they differ in terms of investor protection and corporate disclosures (Collins, Davie, and Weetman,

1993).[2] Moreover, analysts' behaviours also exhibit significant dissimilarities. Compared to U.S. analysts, U.K. analysts demonstrate lower forecast error (Cho, 1994) and consider communications with management more important (Chang and Most, 1981). In addition, U.S. analysts are subject to certain regulations, including the Regulation Fair Disclosure, which requires firms' management to grant all investors equal access to material information. Our investigation is both timely and informative, given that the U.K. economy is the fifth largest in the world, and the U.K. stock market is a leading player in the currently volatile global financial markets due to recent international crises.

Second, this study provides a comprehensive view of how the economic policy uncertainty impacts analysts' behaviours. Unlike existing studies, which focus on analyst forecast accuracy and dispersion,[3] we systematically examine the five main components of analysts' behaviours: forecast accuracy, forecast dispersion, coverage, and stock upgrade and downgrade recommendations. The literature has documented inconsistencies between analyst earnings forecasts and stock recommendations, although they are analysts' two main research outputs. Specifically, earnings forecasts and stock recommendations predict firms' prospects differently.[4] Furthermore, forecast accuracy is not always positively

[2] The United States and United Kingdom share many similarities, such as the common law-based legal systems, artistic cultures, political ethoses, and market-based financial systems (La Porta, Lopez-de-Silanes, and Shleifer, 2008). However, they are dissimilar in many other respects. U.S. investors have greater protections than their U.K. counterparts, with the SEC enforcing sometimes-draconian sanctions against wrongdoers (e.g., the Sarbanes Oxley Act). On the other hand, compared to U.S. companies, U.K. companies provide more informative reports, greater disclosures of risk and uncertainty, and more forward-looking information (Collins, Davie, and Weetman, 1993).

[3] Extant studies have focused on the impact of macro uncertainty on analysts' forecasting performance, mainly on their earnings forecast accuracy and earnings forecast dispersion (e.g., Amiram, Landsman, Owens, and Stubben, 2018, Baloria and Mamo, 2017; Hope & Kang, 2005) but a few studies examine the impact on analyst stock recommendations (e.g., Lin, 2018).

[4] A buy-and-hold investment strategy based on firm value estimated using analyst earnings forecasts and residual income models outperforms an investment strategy based on analyst stock recommendations (Barniv, Hope, Myring, and Thomas, 2010; Bradshaw, 2004).

related to recommendation profitability.[5] Our findings show that although the macroeconomic uncertainty negatively affects U.K. financial analysts, as the decrease in forecast accuracy shows, they tend to herd when issuing forecasts and act conservatively when revising stock recommendations in times of greater macroeconomic uncertainties.

Third, we provide evidence of the cross-country spillover effects in terms of policy uncertainty by demonstrating that the effects of European and global macroeconomic policy uncertainties on U.K. financial analysts are similar to the effect of U.K. macroeconomic policy uncertainty. This illustrates that along with the benefits of globalization, countries will have to bear more risks and uncertainties. Further, such uncertainties may appear in many aspects (e.g., financial analysts), even those not directly associated with international trade.

The rest of the paper is organized as follows: Section 2 discusses the hypotheses, Section 3 discusses the research design, and Section 4 discusses the empirical results and robustness test. A summary and conclusion are provided in Section 5.

2. Brief Literature Review and Hypothesis Development

Uncertainty refers to the situation when investors do not clearly know the probability measure governing future stock prices. People are adverse to uncertainty (Ahn, Choi, Gale, and Kariv, 2014; Bossaerts, Ghirardato, Guarnaschelli, and Zame, 2010). Whether economic policy uncertainty has a significant impact on analysts' behaviours is a topic

[5] For buy recommendations, this positive relation holds only for analysts with no conflict of interest from investment banking activities. For hold recommendations, this conclusion holds only for conflicted analysts (Ertimur, Sunder, and Sunder, 2007). This inconsistency arises partly from the negative influence of investment banking in the United States (Barniv, Hope, Myring, and Thomas, 2009; Chen and Chen, 2009).

engaging considerable academic interest. When policy uncertainty is high, the forecasting environment is more challenging, with greater fluctuations in firms' operating activities and increased asymmetry of information between firms and analysts. For example, firms reduce investments and IPOs when uncertainty increases around the time of gubernatorial elections in the United States and when national elections take place across the globe (Colak, Durnev, and Qian, 2016; Jens, 2017; Julio and Yook, 2012). Such changes complicate the analysts' tasks when they are seeking to predict firms' earnings forecasts. Extant research has documented that analyst earnings forecasts are less accurate during bad times (Hope and Kang, 2005; Jacob, 1997) and during presidential elections in the United States (Baloria and Mamo, 2017). Based on the foregoing discussions, we hypothesized the following.

Hypothesis 1: Macroeconomic uncertainty is negatively related to earnings forecast accuracy.

The second measure of analyst behaviours is their earnings forecast dispersion, which reflects the standard deviation of earnings forecasts all analysts have issued for the same firm in the same period. Research has demonstrated that analysts exhibit herding behaviour; that is, they refer to peer analyst earnings forecasts and then issue similar forecasts, ignoring their own research (Clement and Tse, 2005; Jegadeesh and Kim, 2010; Lamont, 2002), seeking either to share blame or match the forecast quality of their counterparts in the industry. Analysts herd for many reasons, for example, belief in better information, receipt of greater compensation, or enhancement of reputation (e.g., Scharfsten and Stein, 1990; Trueman, 1994). Further, Lin (2018) reports that analysts' tendency to herd increases with the uncertainty of future aggregate equity returns. We

argue that analysts behave similarly and herd when uncertainty results because of heightened concerns over economic policies. Specifically, such uncertainty increases uncertainties in relation to firms' operations, financing, cash holdings, IPOs, and mergers and acquisitions (Bonaime, Gulen, and Ion, 2018; Colak, et al., 2016; Jens, 2017; Julio and Yook, 2012), which, in turn, increases the complexity of forecast issuance. Heightened uncertainty can also increase analysts' job insecurity in times of recession, motivating them to join the herd to escape individual blame. Because adaptation to a group norm means analysts tend to issue similar forecasts, we expect less forecast dispersion considering that macroeconomic uncertainty intensifies analysts' herding instincts. Therefore, our corresponding hypothesis is the following.

Hypothesis 2: Macroeconomic uncertainty is negatively related to earnings forecast dispersion.

The third measure of analyst behaviour is analyst coverage, which is the number of analysts following a firm. Prior research has documented uncertainty drives investor demand for analyst research in valuation and investment decisions. For example, Barniv and Cao (2009) find that investors in restatement firms have a greater demand for accurate analyst forecasts than investors in non-restatement firms. Amiram et al. (2018) report that during periods of high market, industry, and corporate uncertainty,[6] analyst forecasts are less accurate but timelier yet still trigger significant market reactions. This indicates that investors demand timely information, regardless of its lower accuracy. Amiram et al. (2018)

[6] Market uncertainty is measured as the standard deviation of the value-weighted daily market return over the 30 days prior to analyst forecast. Industry uncertainty is measured as the standard deviation of the value-weighted daily industry return (in excess of the daily value-weighted market return) over the 30 days prior to the forecast. Firm uncertainty is measured as the standard deviation of firm's stock return (in excess of the daily value-weighted industry return) over the 30 days prior to the forecast.

also observe that it is more challenging for analysts to deal with heightened market uncertainty than with industrial and corporate uncertainty, as declines in both timeliness and forecast accuracy demonstrate. In addition to investors, a firm's management are also aware of the greater information asymmetry prevailing during times of uncertainty and demand information from more channels. Kirk (2011) consider firms that face greater uncertainty are those that have a higher standard deviation of stock returns, that are in the high-technology industries, and that are more R&D intensive. He finds that these firms are more likely to hire fee-based analyst research firms to increase analyst coverage. The increase in analyst coverage reduces the information asymmetry between the investors and firms, facilitates firms' access to the capital market, and reduces firms' costs of capital (Bushee & Miller, 2012; Easley and O'Hara, 2004).

In a similar way to the uncertainty experienced at the firm and industry levels, macroeconomic uncertainty increases information asymmetry that, in turn, affects firms' liquidity and costs of capital. Both the investors and managers demand increased analyst coverage during times of uncertainty. Based on the foregoing discussions, we hypothesize the following.

Hypothesis 3: Macro-economic uncertainty is positively related to analyst coverage, depending on the trade-off between incentives and the costs of coverage.

The fourth and fifth measures of analyst behaviour are analyst recommendation upgrades and recommendation downgrades, which are more likely to generate additional trading than analysts' earnings forecasts (Irvine, 2004). Analysts' recommendations usually contain market- and industry-level information about future returns and earnings (e.g., Bradshaw, 2004; Howe, Unlu, and Yan, 2009). Research has established that macro

uncertainty has an influence on analysts' recommendations. Bradshaw (2004) demonstrates a positive relationship between analysts' stock recommendation revisions and changes in long-term growth. Because the prediction of long-term growth is negatively correlated with macro uncertainty (Kneller and Young, 2001), a negative and a positive association should exist between macro policy uncertainty and upgrade and downgrade recommendations, respectively.

However, in addition to stock valuations based on analysts' primary research, analysts issue or revise stock recommendations based on many other considerations, including private communications with firms' managers and the generation of underwriting business, which determines their financial compensation (Brown et al., 2015; Soltes, 2014). Thus, analysts are reluctant to downgrade stocks (Westphal and Clement, 2008), even at times of macro uncertainty. Taking these factors into account, during a period of macro-economic uncertainty, analysts are unlikely to revise their recommendations upward because they are not positive about firms' long-term growth prospects. However, they are also unlikely to revise their recommendations downward because of their close connections with the firms' managers. Our corresponding hypothesis therefore is as follows.

Hypothesis 4: Macro-economic uncertainty is negatively related to recommendation upgrades and downgrades.

3. Data and Methodology

3.1 Research Design

When examining the relationship between analyst performance and macro uncertainty, we

follow standard methods reported in the literature and control for firm-level characteristics and macro factors (Baloria and Mamo 2017; Hope and Kang 2015). We use the following model:

$$\text{Analyst performance}_{i,t} = \alpha\ \text{Macro\_uncertainty}_{i,t} + \beta_1\ \text{ROA}_{i,t} + \beta_2\ \text{Leverage}_{i,t} + \beta_3 \text{Smooth}_{i,t} + \beta_4\ \text{Size}_{i,t} + \beta_5\ \text{Sentiment}_{i,t} + \beta_6\ \text{MKT Volatility}_{i,t} + \text{Industry fixed effect} + \varepsilon_{i,t}, \quad (1)$$

where Macro_uncertainty is measured with U.K. EPU. We employ the weighted average of the original indices developed by Baker et al. (2016) to calculate U.K. EPU.[7] We assign two thirds of the weight to the month prior to the last month (November) in a given year *t* because analysts will need time to observe the effect of the macro uncertainty on firms or to incorporate the uncertainty information into their earnings forecasts and stock recommendations. We assign one third of the weight to the second to last month (October) in a given year *t* because macro uncertainty may have lingering effects on firms and analysts.

$$\text{UKEPU}_{t,m} = \frac{\left(\frac{2}{3}\right)\text{EPU}_{t,(m-1)} + \left(\frac{1}{3}\right)\text{EPU}_{t,(m-2)}}{1{,}000} \quad (2)$$

Analyst performance is measured with earnings forecast accuracy, earnings forecast dispersion, analyst coverage, stock recommendation upgrades, and stock recommendation downgrades. Following prior literature on analysts, forecast accuracy

[7] We derive similar results from using different weights of the policy uncertainty index in the formation period.

(accuracy) is calculated as −1 times the absolute difference between the mean analyst earnings forecast per share over a year and firms' actual earnings per share scaled by the price per share.[8] Forecast dispersion (dispersion) is the standard deviation of all analyst earnings forecasts issued for a firm over a year. Analyst coverage (logfollow) is calculated as the natural logarithm of the sum of one plus the number of analysts following a firm. Stock recommendation upgrades (lognumrecup) is calculated as the natural logarithm of the sum of one plus the number of recommendations that have been revised upward, whereas recommendation downgrades (lognumrecdown) is calculated as the natural logarithm of the sum of one plus the number of recommendations that have been revised downward. The calculation of these variables is demonstrated below:

$$\text{Analyst earnings forecast accuracy}_{i,t} = (-1) * \left| \frac{\text{mean EPS}_{i,t} - \text{actual EPS}_{i,t}}{\text{price per share}_{i,t}} \right| \quad (3)$$

$$\text{Analyst coverage (logfollow)}_{i,t} = \log [\text{sum (1+ number of analysts following a firm}_{i,t})] \quad (4)$$

$$\text{Stock recommendation upgrades (lognumrecup}_{i,t}) = \log [\text{sum (1+ number of upward recommendation revisions}_{i,t})] \quad (5)$$

$$\text{Stock recommendation downgrades (lognumredown}_{i,t}) = \log [\text{sum (1+ number of downward recommendation revisions}_{i,t})] \quad (6)$$

We control firm level characteristics to isolate the effects of macro uncertainty on analyst performance because prior research has documented a correlation between analyst behaviour and firm characteristics. For example, Barth, Kasznik, and McNichols (2001)

[8] We use the consensus analyst EPS forecast, the actual firm EPS, and the price per share in the last month to calculate the analyst forecast accuracy, following prior literature on analysts.

demonstrate that analyst coverage is positively associated with firm size, growth, equity issuance, and perceived mispricing. Thus, we control for firm size, return on assets, leverage, and income smoothing. Return on assets (ROA) is calculated as the income before extraordinary items divided by the average total assets. Leverage (Leverage) is calculated as total long-term debt divided by the average total assets. Firm size (Size) is calculated as the natural logarithm of the total assets. Income smoothing (Smooth) is calculated as the standard deviation of earnings divided by the standard deviations of cash flows from operations, where earnings and cash flows are divided by the lagged total assets (Baik, Choi, and Farber, 2020).

We also control for other macro factors that potentially influence analyst behaviours to isolate the effects of macro uncertainty on analyst behaviour. We include investor sentiment (Sentiment) as a macro-level control variable because Walther and Willis (2013) find that this is significantly related to forecast accuracy. Following Lemmon and Portniaguina (2006) and Schmeling (2009), we use the standard deviation of the consumer confidence index over the year as a proxy for investor sentiment. Similarly, Amiram et al. (2018) find that market volatility significantly affects forecast accuracy. Therefore, we control for market volatility (MKT Volatility) as measured by the standard deviation of the Financial Times Stock Exchange 100 index (the FTSE index) over the year.

In addition, we control for industry fixed effects in the regressions. The Appendix A presents the variable descriptions in detail. All dependent variables and control variables are winsorized at the 1% and 99% levels to minimize the effect of outliers.

3.2 Data and Sample

We obtain analyst data from I/B/E/S and firms' financial data from Compustat Global. We start with all U.K. firms with 1-year-ahead analyst earnings forecasts available on I/B/E/S and delete any observation with missing data on the control variables. The final sample covers 1998–2016 and comprises 1,893 firms with 12,717 firm-year observations. Table 1 describes the sample selection.

Table 2 presents the descriptive statistics and correlations for all variables. Panel A reports that the mean (median) analyst earnings forecasts accuracy is 0.0835 (−0.0122), the mean (median) dispersion of earnings forecasts is 0.1024 (0.0284), and the mean (median) log of analyst following for a firm in a single year is 1.7450 (1.6094), equivalent to a mean of 4.72 (3.99) for the analyst following. The mean log of the number of analyst upward recommendation revisions is 0.1028, equivalent to 0.11 upward recommendation revisions. The mean log of the number of analyst downward recommendation revisions is 0.1118, equivalent to 0.12 downward recommendation revisions. The medians of the log of downward recommendation revisions and upward revisions are both 0.0000, equivalent to 0 downward and upward recommendation revisions. In addition, firms in the United Kingdom have a mean (median) ROA of −0.0988 (0.0244), a mean (median) leverage of 0.5955 (0.5087), and a mean (median) size of 4.2390 (3.9729). The consumer confidence index, as a proxy for market sentiment, has a mean (median) of 0.7578 (0.5725), and the volatility of the FTSE index is 2.986%, on average.

Panel B of Table 2 presents the Pearson correlation of the variables used in this study. The EPU index is negatively correlated with accuracy but positively correlated with analysts coverage, indicating that when there is economic uncertainty, firms' forecasting is more complex and is therefore followed by more analysts. The index is also positively

correlated with firm size, the market sentiment index, and stock market volatility. This suggests that larger firms are more likely to be influenced by uncertainty in economic policy because analysts pay closer attention to their forecasts during economic fluctuations, so that their consequential prognostications influence, in their turn, both investors and the stock market.

4. Empirical Results and Discussions

4.1 U.K. Policy Uncertainty and Analyst Behaviours

Table 3 reports the results of the relationships between U.K. policy uncertainty and proxies for analyst behaviours after controlling for other macro-level variables and firm-level variables. Column 1 shows that analyst forecast accuracy is negatively related to U.K. policy uncertainty after controlling for the variables, consistent with Hypothesis 1, which indicates that analyst earnings forecasts are less accurate during times of macroeconomic uncertainty. Similar findings have been made in the United States. Baloria and Mamo (2017) find less accurate analyst forecasts around times of presidential elections.

Column 2 shows that analyst forecast dispersion is negatively related to U.K. policy uncertainty after controlling for the variables, consistent with Hypothesis 2, demonstrating that analysts herd more during times of macroeconomic uncertainty. This finding is in line with the conclusion of Lin (2018) that analysts' tendency to herd increases with the uncertainty of future aggregate equity returns. In contrast, Baloria and Mamo (2017) find more dispersed analyst forecasts around presidential elections in the United States. This indicates the potential for different analyst behaviours under the impact of the macro environments in the United Kingdom and United States. Interestingly, Column 3 shows

that analyst forecast coverage is insignificantly related to U.K. policy uncertainty after controlling for the variables. Although this cross-sectional sample does not support our Hypothesis 3, we investigate this hypothesis further in the industry analyses section.

Columns 4 and 5 report significantly negative coefficients on the log of the number of recommendation upgrades and the log of the number of recommendation downgrades. This supports our Hypothesis 4 that analysts are reluctant to revise their recommendations during times of macroeconomic uncertainty because they are concerned with firms' prospects and damaging their connection to firms' managers. This is consistent with prior findings that when issuing their research products, analysts consider multiple sources of information, such as their own research, firms' financial statements, private information obtained from firms' managers, and brokerage firms' underwriting business (Brown, Call, Clement, and Sharp, 2015; Soltes, 2014; Westphal and Clement, 2008).

The above results show that in the United Kingdom, macroeconomic uncertainty increases the complexity of analysts' tasks, which, in turn, intensifies analysts' herding behaviour. Although analysts are not positive enough to revise stock recommendations upward, analysts also are unwilling to revise stock recommendations downward, probably due to concerns about damaging their relationships with firm management. This is in contrast to the findings for the United States, as documented in Baloria and Mamo (2017), that analyst earnings forecasts are less accurate and more dispersed when the macroeconomy is more uncertain. We also provide novel evidence of the impacts of macroeconomic uncertainty on analyst coverage and stock recommendations, which have not been studied in the U.S. setting.

4.2 Industry-level Effect

Prior research has asserted that firms in some industries are more sensitive to policy uncertainty than firms in other sectors (Gulen and Ion, 2016). If firms operating in industries related to the government are more sensitive to policy uncertainty, analysts find it more challenging to deal with information concerning them. Boutchkova, Doshi, Durnev, and Molchanov (2012) demonstrate that the impact of political uncertainty on firms' decisions depends on three industry characteristics: contract enforcement, labour intensity, and international trade exposure, a conclusion that is also supported by Baloria and Mamo (2017).

Further, Amiram et al. (2018) demonstrate that analysts achieve greater forecast accuracy when faced with heightened industry uncertainty than they do when confronted by market- and firm-level uncertainty. This suggests that analysts are able to make more accurate forecasts in some industries than in others because of their experiences (Bradley, Gokkaya, and Liu, 2017). Kadan, Madureira, Wang, and Zach (2012) provide further evidence of analysts' industry expertise on the basis of the recommendations they make in specific industries. Taken together, policy uncertainty would have greater impacts on industries that are more sensitive to policy uncertainty.

To identify the impact of economic policy uncertainty on analyst behaviours, we conduct an industry-level analysis. We use the NAICS industry system and focus on industries with more than 100 observations, which are (a) mining; (b) utilities; (c) construction; (d) manufacturing; (e) wholesale trade; (f) retail trade; (g) transportation and warehousing; (h) information; (i) professional, scientific, and technical services; (j) administrative support and waste management and remediation; (k) arts, entertainment, and

recreation; and (l) accommodation and food services.

Table 4 reports the results across these industries. Panel A reports the results of analyst earnings forecast accuracy. These findings show that the coefficient of policy uncertainty is significantly negative in the mining sector. Untabulated analyses of the regression in more detailed NAICS industry classifications within the mining sector demonstrates that analyst forecast accuracy is significantly negative in the oil and gas industries. This is consistent with prior research on the significant relationships between oil and gas industry uncertainty and macroeconomic uncertainty (Barsky and Kilian, 2004; Hamilton, 1983). In addition, our results show that analyst earnings forecasts are less accurate during downturns of the macroeconomy, predominantly in the oil and gas industries.

Panel B reports the results of the analyst earnings forecast dispersion. Our results indicate that a significant negative relationship between policy uncertainty and analyst forecast dispersion is present in the construction sector. Untabulated analyses reveal that the significant negative relationship in the residential construction industry dominates the effect in the construction sector. Analyst forecast dispersion is also significantly negatively related to policy uncertainty in the information sector, especially in the industry sector of internet publishing, broadcasting, and web search portals (untabulated). This could be because the generally greater demand to gather more information during periods of uncertainty has resulted in better prospects for firms in the internet, broadcasting, and web search industries (Bontempi, Frigeri, Golinelli, and Squadrani 2019).

Analyst forecast dispersion is significantly positive in the transportation and warehousing sector. Interestingly, forecast dispersion is significantly positive in the air

transportation industry but negative in industries providing supporting activities for air transportation and water transportation (untabulated). The air transportation industry has experienced many storms such as the Great Depression and the attacks on September 11, 2001, and had to reduce capacity to adjust to increased costs given the decline in demand during times of uncertainty (Franke and John, 2011; Pearce, 2012). The reduction in demand and changes in capacity complicate forecasting tasks and exacerbate analysts' opinions on firms' earnings, which will result in greater forecast dispersion.

Panel C reports the results for analyst coverage in the 12 broad sectors. We find converse impacts of policy uncertainty on analyst coverage across industries. The coefficients of policy uncertainty are significantly positive in the manufacturing sector, whereas they are significantly negative in the retail trade and the arts, entertainment, and recreation sectors. Such an effect indicates investors have a greater demand for analyst research on the manufacturing sector due to the production of life necessities and the production of equipment to potentially restart businesses.

In contrast, investors demand less information on the retail trade, and the arts, entertainment, and recreation sectors probably because of the declines in business these industries experience during times of uncertainty. The offsetting effects in these industries explain the insignificant coefficient of analyst coverage in the aggregate sample. Overall, these results imply a significant industry effect on the relationship between EPU and analyst coverage.

Panels D and E report the results for analyst recommendation revisions. Panel D shows that the EPU coefficient is significantly negative for upward recommendation revisions in several industries, namely, manufacturing, transportation, communication,

electric, gas and sanitary services, wholesale trade, and retail trade and services. This suggests that analysts are reluctant to upgrade recommendations for firms in these industries when policy uncertainty is high.

Panel E reports that in the case of downward recommendation revisions, the EPU coefficient is significantly negative in manufacturing, transportation, communication, electric, gas and sanitary services, and retail trade. This suggests that analysts are reluctant to downgrade recommendations for firms in these industries when policy uncertainty is high. It is interesting that analysts are hesitant to revise their recommendations either upward or downward for similar industries. Our results, in general, suggest that analysts tend to be reluctant to revise their recommendations upward or downward for most industries when policy uncertainty is high.

In sum, policy uncertainty has different impacts on analyst behaviours across industries. Most notably, policy uncertainty has opposing impacts on analyst coverage across industries, leading to an insignificant impact for the overall sample, as shown in Table 3.

4.3 Cross-Country Impacts of Policy Uncertainty on Analyst Behaviours

With increasing globalization, economies around the world have become dynamically interrelated. Rapach, Strauss, and Zhou (2013) find that lagged U.S. market returns can significantly predict returns in many non-U.S. industrialized countries. Brogaard, Dai, Ngo, and Zhang (2020) contend that political uncertainty as measured by the U.S. election cycle has a significant impact on asset prices in other countries. The United Kingdom is the fifth largest economy in the world during our study period and thus plays an important role in

the world economy, because its own economy is globally well integrated. In this subsection, we investigate whether, and in what ways, policy uncertainty in other regions significantly influences analyst behaviours in the United Kingdom. In particular, we examine the individual impacts of the U.S., European, and global policy uncertainties on analyst behaviours.

Table 5 reports the results of the impact of policy uncertainty in the United States on analyst behaviours in the United Kingdom. First, the U.S. EPU coefficient is significant and negative in the case of analyst earnings forecast accuracy, suggesting that policy uncertainty in the United States has a significant and negative impact on analyst forecast accuracy in the United Kingdom. Second, the U.S. EPU coefficient is insignificant in the case of the analyst earnings forecast dispersion, demonstrating that policy uncertainty in the United States has no impact on analyst forecast dispersion in the United Kingdom. Third, the coefficient of analyst coverage is significantly positive, indicating that more analysts in the United Kingdom tend to follow firms when policy uncertainty in the United States is high.

Fourth, the U.S. EPU coefficient is insignificant and negative in the case of recommendation upgrade revisions, suggesting that analysts are reluctant to upgrade recommendations for U.K. firms when policy uncertainty in the United States is high. However, the U.S. EPU coefficient is insignificant in the case of recommendation downgrade revisions, suggesting that policy uncertainty in the United States has no significant impact on analyst recommendation downgrade revisions. This reveals that despite the close connections between the United States and United Kingdom, the market and information environments are still different. Investors and analysts refer to the specific

macro policies in each country in their decision-making processes. Overall, these results demonstrate that policy uncertainty in the United States has a differing impact on analyst dispersion, coverage, and recommendation downgrade revisions in the United Kingdom.

Table 6 reports the results of the impact of European EPU on analyst behaviours in the United Kingdom. The United Kingdom is a major economy in the European zone; therefore, we expect policy uncertainty in Europe to have a more significant impact on analyst behaviours in the United Kingdom than U.S. uncertainty. Consistent with our predictions, policy uncertainty in Europe has a significant impact on analyst forecast accuracy for the United Kingdom. Second, consistent with our findings for the U.K. EPU, policy uncertainty in Europe increases analyst earnings forecast dispersion in the United Kingdom.

Third, consistent with the insignificant effect of U.K. EPU over analyst coverage, the European EPU has an insignificant impact on analyst coverage. Fourth, in alignment with our findings for U.K. EPU, the European EPU coefficients are significantly negative in the case of both recommendation upgrade and downgrade revisions, suggesting that analysts are reluctant to revise their recommendations upward or downward in the United Kingdom when policy uncertainty in Europe is high. Overall, these results show that policy uncertainty in Europe has a significant impact on some aspects of analyst behaviours in the United Kingdom.

Table 7 reports the results for the impact of global EPU on analyst behaviours in the United Kingdom. First, global policy uncertainty has a significant negative impact on analyst forecast accuracy. Second, consistent with our finding on European EPU, we observe that policy uncertainty around the world has a significant negative impact on the

analyst earnings forecast dispersion in the United Kingdom. Third, global policy uncertainty has no significant impact on analyst coverage in the United Kingdom.

Fourth, in line with our findings for recommendation upgrade and downgrade revisions in the United Kingdom, the negative global EPU coefficients suggests that analysts are reluctant to revise their recommendations upward or downward in the United Kingdom when global policy uncertainty is high. Overall, these results demonstrate that policy uncertainty around the world has a significant impact on some aspects of analyst behaviours in the United Kingdom.

In sum, we find that U.S., European, and global policy uncertainties has significant negative impacts on analyst earnings forecast accuracy in the United Kingdom. In addition, European and global policy uncertainties have similar effects to U.K. policy uncertainty on analyst behaviours in the United Kingdom. However, U.S. policy uncertainty has differing impacts on analyst dispersion, coverage, and recommendations in the United Kingdom. Overall, our results demonstrate that policy uncertainty has cross-country effects on analyst behaviours in other countries.

4.4 Robust Test

We examine the validity of the effect of EPU on analyst behaviours by including additional macro-level factors in the models. Specifically, we include the geopolitical risk and an indicator of macroeconomic activity in United Kingdom. Carney (2016) considers the geopolitical risk as influential as the economic and policy uncertainty because of the significant adverse economic effects. The European Central Bank and the International

Monetary Fund highlight geopolitical uncertainties as a salient risk to the economies. [9] We measure geopolitical risk with the geopolitical risk index developed by Caldara and Lacoviello (2017). This index is the results of automated newspaper text-search of words associated with geopolitical risk, nuclear tensions, war threats, terrorist threats, and actual adverse geopolitical events.

We measure the macroeconomic activity with annual GDP growth because GDP is a key summary statistic of the economy (e.g., McCulla & Smith, 2007) [10] . Henderson, Storeygard, and Weil (2012) consider GDP as the most important variable in analyses of economic growth. Financial analysts are likely to factor the geopolitical risk and GDP growth in their earnings forecasts and stock recommendations. Including the geopolitical risk and the GDP growth in the models will isolate the effects of EPU on analyst behaviours, and thus can test the robustness of EPU's effects.

We examine whether the effects of EPU on analyst behaviours are still significant after controlling for these two variables. Columns 1, 3, 5 and 7 in Table 8 tabulate the results after we only include geopolitical risk index in the main analyses. Columns 2, 4, 6 and 8 in Table 8 tabulate the results after both geopolitical risk index and the GDP growth rate are controlled. The independent variable, U.K. EPU, continues to be significantly negatively related with analyst forecast accuracy, analyst coverage, analyst recommendation upgrades and downgrades. The original findings continue to hold.

[9] The International Monetary Fund addresses geopolitical uncertainties in the 2017 World Economic Outlook report. The report is available at https://www.imf.org/en/Publications/WEO/Issues/2017/09/19/world-economic-outlook-october-2017. The European Central Bank discusses the importance of geopolitical task in the Economic Bulletin in 2017. It is available at https://www.ecb.europa.eu/pub/pdf/ecbu/eb201704.en.pdf.
[10] We obtain the annual GDP growth from the website of the Organisation for Economic Co-operation and Development (OECD).

5. Conclusions

This paper investigates the impact of policy uncertainty on analyst behaviours in the United Kingdom. We find that greater U.K. EPU leads to less accurate earnings forecasts but lower forecast dispersion among analysts in the United Kingdom. Analysts tend to be reluctant to revise their recommendations upward or downward when policy uncertainty is high, suggesting that they consider not only firms' prospects but also their relationships with firms' managers during uncertain times. However, policy uncertainty has no significant impact on analyst coverage when we control for firm-specific variables. The industry analysis reveals that policy uncertainty has different impacts on analyst behaviours across industries. Notably, it produces converse influences on analyst coverage in different industries.

Finally, we provide strong evidence of cross-country effects of policy uncertainty by demonstrating that policy uncertainties in the United States, Europe, and around the world have significant impacts on analyst behaviours in the United Kingdom, arguably because the latter plays a significant role in the international market and because the U.K. economy is well integrated into world trade and the global economy.

Our paper has implications for financial analysts, policy makers, firm managers and investors. Financial analysts should be aware that not just domestic uncertainty but also foreign uncertainty will complicate their tasks, and they are encouraged to explore tools or do research to predict and incorporate such uncertainties better. For example, they could seek access to an economist or award-winning macroeconomists. On the other hand, when proposing certain policies, policy makers should consider the potential impact of

information dissemination on the capital market.

Firm managers should be aware of the impacts of uncertainties on analysts' research and provide voluntary disclosures on firms' practices to cope with uncertainty. This will assist both analysts and investors with investment decisions. Investors should be investing more cautiously during uncertain times and refer to more trustworthy sources for investing advices, for example, earnings forecasts and stock recommendations from award-winning analysts. Our findings signpost a direction for future research to investigate how global policy uncertainty affects analyst behaviours around the world.

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Appendix A: Variable definitions

Accuracy	Earnings forecast accuracy, which is calculated as −1 times the absolute value of the difference between the mean analyst earnings forecast per share over a year and firms' actual earnings per share divided by the price per share.
Dispersion	Earnings forecast dispersion, which is calculated as the standard deviation of all individual analyst earnings forecasts issued for a firm over a year. Individual analyst earnings forecasts are obtained from I/B/E/S detail file.
Logfollow	Analyst coverage (number of analysts following a firm in a year), which is measured as the natural logarithm of the sum of one plus the number of analysts following a firm.
Lognumrecup	Number of recommendations revised upward (upgrade), which is measured as the natural logarithm of the sum of one plus the number of recommendations that have been revised upward.
Lognumrecdown	Number of recommendations revised downward (downgrade), which is measured as the natural logarithm of the sum of one plus the number of recommendations that have been revised downward.
EPU	The weighted-average value of monthly EPU indices of the most recent two months. The EPU index is the economic policy uncertainty index constructed by Baker et al. (2016).
Sentiment	Investor sentiment, which is measured as the standard deviation of the consumer confidence index over the year. The consumer confidence index is obtained from the OECD.
MKT Volatility	Stock market volatility, which is measured as the standard deviation of the FTSE index over the year.
ROA	Return on assets, which is calculated as the income before extraordinary items divided by average total assets.
Leverage	Firm leverage, which is calculated as total long-term debt divided by average total assets.
Smooth	Income smoothing, which is measured as the standard deviation of earnings divided by the standard deviations of cash flows from operations, where earnings and cash flows are scaled by lagged total assets (Baik et al., 2017).
Size	Firm size, which is calculated as the natural logarithm of total assets.

Table 1: Sample Selection

All Compustat firms with firm financial data in UK between 1998 and 2018	21,936
Less: Observations with missing I/B/E/S analyst earnings forecasts or recommendations	8,779
Less: Observations with missing data to compute U.K. EPU	440
Final sample for main analysis	12,717

Table 2: Descriptive statistics and correlations

This table presents the descriptive statistics and correlation of variables. Panel A reports the summary statistics of the main variables used in our regression analyses, including the mean, deviation error (SD), 10th percentile (10%), 25th percentile (25%), median, 75th percentile (75%), and 90th percentile (90%) in the full sample. All variables are defined in Appendix 1. Panel B reports the correlation of variables.

Panel A: Descriptive Statistics

Variable	N	Mean	Standard deviation	10th Percentile	25th Percentile	Medium	75th Percentile	90th Percentile
Accuracy	11,219	-0.084	0.671	-0.106	-0.035	-0.012	-0.005	-0.003
Dispersion	10,966	0.102	0.516	0.004	0.011	0.028	0.067	0.155
Logfollow	12,344	1.745	0.884	0.693	1.099	1.609	2.485	3.091
Lognumrecup	11,712	0.103	0.277	0.000	0.000	0.000	0.000	0.693
Lognumrecdown	11,712	0.112	0.292	0.000	0.000	0.000	0.000	0.693
UK EPU	21,294	1.282	0.520	0.611	0.835	1.267	1.624	1.786
US EPU	21,294	1.325	0.370	0.887	1.045	1.279	1.534	1.929
European EPU	21,294	1.584	0.557	0.937	1.087	1.451	1.962	2.438
Global EPU	21,294	1.248	0.356	0.802	0.905	1.249	1.466	1.720
ROA	21,294	-0.099	0.963	-0.409	-0.101	0.024	0.075	0.134
Leverage	21,294	0.596	2.252	0.130	0.298	0.509	0.709	0.920
Smooth	21,294	1.299	16.300	0.311	0.525	0.848	1.264	1.978
Size	21,294	4.239	2.349	1.396	2.467	3.973	5.724	7.566
Sentiment	21,294	0.758	0.450	0.289	0.416	0.573	0.963	1.308
MKT Volatility	21,294	2.986	1.595	1.474	1.771	2.412	4.067	5.561

Panel B: Correlations

		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	Accuracy	-0.115	0.074***	0.028***	0.027***	-0.035***	-0.038***	-0.026***	-0.034***	0.126***	0.030***	-0.021**	0.067***	-0.047***	-0.051***
(2)	Dispersion		0.016*	0.016	0.011	0.005	0.012	-0.009	-0.002	-0.084	-0.005	0.013	0.023**	0.040***	0.036***
(3)	Logfollow			0.389***	0.396***	0.063***	0.059	0.071***	0.070***	0.238***	0.204***	0.003	0.816***	0.008	-0.002
(4)	Lognumrecup				0.180***	-0.011	0.009	-0.010	-0.008	0.076***	0.070***	-0.001	0.333***	0.015	0.012
(5)	Lognumrecdown					0.005	0.035***	0.021**	0.024**	0.071***	0.060***	-0.002	0.351***	0.013	0.012
(6)	UK EPU						0.613***	0.784***	0.850***	0.003	0.001	0.002	0.101***	0.431***	0.363***
(7)	US EPU							0.727***	0.807***	-0.007	-0.007	0.003	0.046***	0.253***	0.205***
(8)	European EPU								0.947***	-0.008	0.002	0.010	0.093***	0.096***	0.023***
(9)	Global EPU									-0.008	0.000	0.006	0.091***	0.247***	0.228***
(10)	ROA										-0.776***	-0.013*	0.176***	-0.003	-0.003
(11)	Leverage											-0.001	-0.019***	0.002	-0.003
(12)	Smooth												-0.011	-0.004	-0.007
(13)	Size													0.037***	0.013*
(14)	Sentiment														0.632***
(15)	MKT Volatility														1

Table 3: U.K. Economic policy uncertainty and analyst behaviors

This table presents the average estimated coefficients from regressions of measures of analyst behaviors on U.S. EPU. All variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. T-statistics are in parentheses.

	(1)	*(2)*	*(3)*	*(4)*	*(5)*
	Accuracy	*Dispersion*	*Coverage*	*Upgrade*	*Downgrade*
Intercept	-0.067**	0.022	0.026	-0.112***	-0.132***
	(-2.64)	(1.10)	(1.43)	(-11.80)	(-13.30)
UK EPU	-0.022*	-0.018*	-0.000	-0.030***	-0.021***
	(-1.73)	(-1.85)	(-0.04)	(-5.90)	(-4.00)
ROA	0.344***	-0.231***	-0.073***	-0.033***	-0.049***
	(11.57)	(-9.57)	(-3.54)	(-2.83)	(-4.09)
Leverage	0.042	-0.033*	-0.012	-0.007	-0.022**
	(1.88)	(-1.85)	(-0.85)	(-0.98)	(-2.72)
Smooth	-0.003*	0.001	0.001	0.000	-0.000
	(-1.66)	(0.95)	(0.71)	(0.01)	(-0.16)
Size	0.010***	0.014***	0.336***	0.045***	0.051***
	(2.90)	(5.52)	(143.40)	(36.60)	(39.30)
Sentiment	-0.029	0.038***	0.015	0.013*	0.007
	(-1.55)	(2.64)	(1.09)	(1.77)	(0.98)
MKT Volatility	-0.010**	0.010	-0.010	0.010	0.010
	(-2.23)	(1.43)	(-1.59)	(1.39)	(1.38)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	11,157	10,899	12,243	11,613	11,613
R^2	0.0201	0.0112	0.6644	0.1141	0.1256

Table 4: U.K. economic policy uncertainty and analyst behaviors: an industry analysis

This table presents the average estimated coefficients from regressions of measures of analyst behaviors on economic policy uncertainty (EPU) index in the United Kingdom in 12 industries. These industries are (1) Mining, (2) Utilities, (3) Construction, (4) Manufacturing, (5) Wholesale Trade, (6) Retail Trade, (7) Transportation and Warehousing, (8) Information, (9) Professional, scientific and technical services, (10) Administrative and support and waste management and remediation services, (11) Arts, entertainment, and recreation, and (12) Accommodation and food services. All variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. T-statistics are in parentheses.

Panel A: Industrial analysis for analyst forecast accuracy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-0.145 (-0.70)	0.093 (1.16)	-0.023 (-1.17)	0.011 (0.31)	0.182* (1.72)	0.031 (1.54)	-0.161 (-0.33)	-0.051 (-1.15)	-0.079*** (-3.41)	-0.009 (-0.19)	-0.190* (-1.83)	-0.027*** (-2.75)
UK EPU	-0.186 (-1.78)	-0.028 (-0.84)	-0.011* (-1.65)	-0.014 (-0.73)	0.016 (0.36)	-0.008 (-1.07)	0.087 (0.41)	0.009 (0.36)	0.015 (1.38)	0.004 (0.16)	0.018 (0.41)	0.002 (0.45)
ROA	0.556*** (2.59)	-0.195 (-1.22)	-0.156*** (-3.52)	-0.193*** (-4.34)	-0.541** (-2.27)	-0.151*** (9.37)	1.028 (1.10)	0.178*** (4.33)	0.251*** (10.2)	0.718*** (10.3)	0.130 (0.81)	0.215*** (9.02)
Leverage	0.092 (0.42)	-0.696*** (-9.32)	-0.042** (-2.52)	-0.014 (-0.38)	0.071 (0.75)	-0.023 (-1.09)	0.555 (1.19)	-0.027 (-0.79)	0.017 (1.01)	- 0.159*** (-3.72)	-0.055 (-0.48)	-0.040*** (-3.58)
Smooth	-0.036* (-1.75)	-0.030 (-1.56)	0.001 (0.35)	0.004 (0.80)	-0.001 (-0.25)	-0.001 (-0.33)	0.021 (0.20)	0.009 (1.06)	-0.003 (-0.7)	-0.018* (-1.75)	0.009 (0.21)	-0.001 (-0.02)
Size	0.043 (1.58)	0.048*** (5.34)	0.015*** (6.38)	0.008 (1.55)	-0.020 (-1.29)	0.008*** (3.41)	0.025 (0.43)	0.008 (1.59)	0.005 (1.57)	0.012* (1.90)	0.017 (1.27)	0.004*** (2.87)
Sentiment	0.094 (0.57)	0.058 (1.24)	0.025** (2.54)	0.033 (1.21)	0.033 (0.54)	-0.016 (-1.29)	-0.389 (-1.39)	-0.016 (-0.43)	0.005 (0.30)	0.016 (0.48)	0.029 (0.42)	-0.001 (-0.17)
MKT Volatility	0.001 (0.33)	0.001 (0.38)	0.001** (2.44)	0.001 (1.50)	-0.001 (-1.28)	-0.001** (-2.91)	-0.001 (-1.40)	-0.001* (-1.85)	-0.001** (-2.03)	-0.001 (-0.81)	0.001 (0.04)	-0.001 (-0.42)
N	1,017	246	448	3,743	387	759	325	1,334	1,109	545	229	383
R^2	0.028	0.278	0.168	0.008	0.151	0.142	0.039	0.028	0.104	0.191	0.015	0.198

Panel B: Industrial analysis for analyst forecast dispersion

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	0.043 (0.38)	0.016 (0.56)	-0.023 (-1.17)	0.038 (1.27)	-0.057* (-1.69)	0.031 (1.54)	-0.012 (-0.34)	0.030 (0.73)	0.022 (0.89)	-0.283* (-1.87)	0.209*** (3.30)	-0.213*** (-3.52)
UK EPU	-0.049 (-0.87)	-0.015 (-1.34)	0.009 (0.71)	0.054 (3.44)	0.005 (0.36)	-0.008 (-1.07)	0.045*** (3.06)	-0.062*** (-2.75)	-0.009 (-0.75)	-0.084 (-1.18)	-0.041 (-1.60)	-0.033 (-1.26)
ROA	-0.109 (-0.83)	0.056 (1.02)	0.598*** (7.28)	-0.246*** (-7.09)	0.476*** (6.08)	-0.151*** (-3.99)	-0.222*** (-3.32)	-0.188*** (-5.08)	-0.239*** (-8.78)	-0.934*** (-4.32)	0.103 (1.06)	-0.285* (-1.88)
Leverage	-0.156 (-1.28)	0.043* (1.69)	0.013 (0.44)	-0.125*** (-4.07)	-0.032 (-1.05)	0.032* (1.66)	0.012 (0.36)	0.041 (1.34)	0.018 (0.95)	0.670*** (4.98)	-0.188*** (-2.77)	0.138** (2.06)
Smooth	0.010 (0.83)	0.007 (1.03)	-0.001 (-0.56)	0.010** (2.25)	0.001 (0.03)	-0.001 (-0.51)	-0.001 (-0.04)	-0.008 (-0.97)	0.001 (0.26)	0.025 (0.63)	0.002 (0.08)	0.022 (1.33)
Size	0.052*** (3.50)	0.006* (1.91)	0.005 (1.17)	0.328*** (79.3)	0.013*** (2.68)	0.002 (0.94)	0.006 (1.31)	0.009* (1.78)	0.004 (1.21)	-0.023 (-1.15)	-0.001 (-0.11)	0.032*** (4.32)
Sentiment	0.105 (1.21)	0.004 (0.29)	-0.014 (-0.81)	0.045** (2.00)	-0.055*** (-2.71)	0.020* (1.72)	-0.004 (-0.19)	0.038 (1.15)	-0.003 (-0.16)	0.022 (0.22)	0.003 (0.07)	0.014 (0.36)
MKT Volatility	-0.001 (-0.36)	-0.001 (-0.39)	-0.001** (-2.28)	-0.001*** (-2.98)	-0.001 (-0.75)	-0.001 (-0.26)	-0.001 (-0.18)	0.001** (1.98)	0.001 (1.25)	0.001* (1.84)	-0.001 (-0.16)	0.001 (1.08)
N	983	238	448	4,200	387	764	315	1,269	1,099	529	228	387
R^2	0.015	0.084	0.149	0.656	0.151	0.033	0.079	0.036	0.071	0.086	0.053	0.095

Panel C: Industrial analysis for analyst coverage

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-0.147***	-0.076	-0.257**	0.038	-0.271***	-0.048	-0.299**	0.049	-0.024	-0.049	-0.163	-0.091
	(-2.61)	(-0.48)	(-2.32)	(1.27)	(-2.69)	(-0.51)	(-2.27)	(1.14)	(-0.44)	(-0.52)	(-1.12)	(-0.76)
UK EPU	0.033	-0.030	-0.048	0.054***	0.026	-0.130***	-0.052	-0.050*	-0.010	0.032	-0.136**	-0.038
	(1.11)	(-0.46)	(-1.22)	(3.44)	(0.57)	(-3.53)	(-0.90)	(-1.94)	(-0.36)	(0.69)	(-2.14)	(-0.71)
ROA	-0.187***	-0.133	0.337	-0.246***	0.555***	1.047***	0.115	0.075**	-0.122**	0.316**	0.632***	1.224***
	(-3.34)	(-0.56)	(1.32)	(-7.09)	(2.59)	(6.08)	(0.49)	(1.97)	(-2.16)	(2.27)	(2.85)	(4.16)
Leverage	0.049	-0.175	-0.546***	-0.125***	-0.142	-0.125	0.432***	0.146***	-0.029	-0.197**	-0.039	0.202
	(0.83)	(-1.20)	(-5.83)	(-4.07)	(-1.50)	(-1.38)	(3.36)	(4.56)	(-0.70)	(-2.38)	(-0.26)	(1.47)
Smooth	-0.002	-0.071*	-0.006	0.010**	0.001	0.008	0.097***	-0.015*	0.040***	0.035*	-0.009	0.068*
	(-0.36)	(-1.84)	(-0.86)	(2.25)	(0.07)	(1.26)	(3.41)	(-1.67)	(3.49)	(1.83)	(-0.15)	(1.94)
Size	0.337***	0.358***	0.432***	0.328***	0.370***	0.403***	0.331***	0.334***	0.353***	0.364***	0.405***	0.349***
	(44.4)	(20.8)	(34.6)	(79.3)	(24.4)	(38.4)	(20.9)	(64.3)	(44.5)	(29.8)	(21.4)	(23.2)
Sentiment	0.002	-0.215**	0.009	0.045**	0.183***	0.114**	-0.015	0.005	-0.030	-0.040	0.198**	-0.020
	(0.03)	(-2.34)	(0.17)	(2.00)	(2.81)	(2.07)	(-0.20)	(0.14)	(-0.77)	(-0.62)	(2.00)	(-0.25)
MKT Volatility	-0.001	0.001	-0.001	-0.001***	-0.001*	-0.001	-0.001	0.001*	-0.001	-0.001	-0.001	0.001
	(-0.98)	(0.99)	(-0.68)	(-2.98)	(-1.75)	(-0.71)	(-0.06)	(1.80)	(-0.19)	(-0.01)	(-0.07)	(0.81)
N	1,178	253	482	4,200	424	802	344	1,493	1,237	594	256	407
R^2	0.705	0.712	0.740	0.656	0.634	0.663	0.643	0.761	0.635	0.6	0.675	0.634

Panel D: Industrial analysis for the number of upward recommendation revisions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-0.218***	-0.051	0.011	-0.107***	-0.072	-0.151***	-0.091	-0.123***	-0.097***	-0.134***	-0.245***	-0.101
	(-6.69)	(-0.43)	(0.15)	(-7.40)	(-1.33)	(-2.66)	(-1.23)	(-4.54)	(-3.59)	(-2.72)	(-3.32)	(-1.42)
UK EPU	-0.013	-0.025	-0.083***	-0.008	-0.036	-0.097***	-0.094***	-0.030*	-0.028**	-0.001	-0.060*	-0.053
	(-0.77)	(-0.52)	(-3.04)	(-1.07)	(-1.53)	(-4.34)	(-2.86)	(-1.93)	(-2.15)	(-0.03)	(-1.75)	(-1.65)
ROA	-0.059*	-0.265	-0.253	-0.040**	0.044	-0.089	-0.039	0.013	-0.044	-0.012	-0.022	0.1333
	(-1.69)	(-1.08)	(-1.38)	(-2.24)	(0.41)	(-0.84)	(-0.30)	(0.54)	(-1.36)	(-0.18)	(-0.20)	(0.79)
Leverage	0.023	-0.074	-0.170***	-0.011	-0.003	-0.124**	0.009	0.030	0.013	-0.042	0.044	0.098
	(0.69)	(-0.68)	(-2.71)	(-1.06)	(-0.06)	(-2.21)	(0.13)	(1.47)	(0.64)	(-0.96)	(0.60)	(1.19)
Smooth	-0.004	-0.026	-0.001	0.005**	-0.001	-0.001	0.009	0.001	-0.003	0.003	0.028	-0.008
	(-1.17)	(-0.97)	(-0.22)	(2.46)	(-0.13)	(-0.13)	(0.59)	(0.08)	(-0.53)	(0.34)	(0.96)	(-0.38)
Size	0.058***	0.055***	0.039***	0.041***	0.039***	0.078***	0.044***	0.047***	0.038***	0.045***	0.059***	0.036***
	(13.4)	(4.01)	(4.74)	(20.2)	(4.97)	(12.1)	(4.94)	(14.7)	(9.86)	(7.14)	(6.20)	(4.02)
Sentiment	0.015	-0.031	0.063*	0.005	-0.008	0.054	-0.031	0.022	0.020	0.004	0.014	-0.034
	(0.59)	(-0.45)	(1.71)	(0.47)	(-0.26)	(1.60)	(-0.74)	(1.02)	(1.07)	(0.12)	(0.30)	(-0.71)
MKT Volatility	0.001	-0.001	0.001	-0.001	-0.001	0.001	0.001	0.001	0.001	0.001	0.001*	0.001*
	(0.61)	(-0.79)	(1.23)	(-0.72)	(-0.08)	(0.48)	(1.85)	(1.04)	(0.46)	(0.94)	(2.02)	(1.79)
N	1,079	249	477	4,004	407	780	339	1,314	1,183	570	255	407
R^2	0.185	0.090	0.085	0.110	0.068	0.273	0.103	0.159	0.086	0.091	0.169	0.073

Panel E: Industrial analysis for the number of downward recommendation revisions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-0.199***	-0.283**	-0.084	-0.134***	-0.153***	-0.111*	-0.120	-0.147***	-0.092***	-0.086*	-0.132*	-0.159**
	(-5.81)	(-2.42)	(-1.08)	(-8.80)	(-2.74)	(-1.72)	(-1.39)	(-5.61)	(-3.05)	(-1.68)	(-1.71)	(-2.46)
UK EPU	-0.025	0.049	-0.060**	-0.020**	-0.028	-0.031	-0.048	0.003	-0.028*	-0.023	-0.021	-0.027
	(-1.37)	(1.02)	(-2.11)	(-2.36)	(-1.15)	(-1.22)	(-1.24)	(0.19)	(-1.93)	(-0.93)	(-0.59)	(-0.93)
ROA	-0.099***	-0.117	-0.173	-0.070***	-0.076	-0.018	-0.012	-0.025	-0.069*	0.019	0.024	0.082
	(-2.71)	(-0.48)	(-0.90)	(-3.70)	(-0.68)	(-0.15)	(-0.08)	(-1.04)	(-1.90)	(0.27)	(0.21)	(0.53)
Leverage	-0.034	-0.038	-0.147**	-0.028**	0.031	-0.012	-0.080	0.002	-0.031	-0.029	-0.043	0.101
	(-0.97)	(-0.35)	(-2.25)	(-2.49)	(0.63)	(-0.19)	(-0.96)	(0.10)	(-1.36)	(-0.63)	(-0.56)	(1.34)
Smooth	-0.005	-0.050*	-0.002	0.004	-0.001	-0.001	0.010	0.005	-0.002	-0.002	-0.034	-0.004
	(-1.47)	(-1.88)	(-0.34)	(1.57)	(-0.33)	(-0.23)	(0.54)	(0.91)	(-0.28)	(-0.17)	(-1.12)	(-0.20)
Size	0.067***	0.066***	0.059***	0.051***	0.040***	0.059***	0.051***	0.047***	0.046***	0.043***	0.063***	0.034***
	(14.7)	(4.79)	(6.88)	(24.0)	(4.90)	(7.99)	(4.93)	(15.3)	(10.5)	(6.50)	(6.35)	(4.11)
Sentiment	-0.019	-0.002	0.022	0.012	0.013	0.025	0.032	-0.005	0.018	0.002	-0.077	0.010
	(-0.69)	(-0.03)	(0.56)	(1.05)	(0.38)	(0.66)	(0.64)	(-0.21)	(0.85)	(0.05)	(-1.53)	(0.24)
MKT Volatility	0.001	0.001	0.001	-0.001	0.001	-0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(1.17)	(0.31)	(0.45)	(-0.47)	(1.17)	(-0.96)	(0.44)	(1.03)	(0.56)	(1.18)	(1.57)	(1.51)
N	1,079	249	477	4,004	407	780	339	1,314	1,183	570	255	407
R^2	0.196	0.127	0.110	0.141	0.071	0.080	0.075	0.163	0.088	0.077	0.165	0.077

Table 5: U.S. economic policy uncertainty and analyst behaviors

This table presents the average estimated coefficients from regressions of measures of analyst behaviors on U.S. EPU. All variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. T-statistics are in parentheses.

	(1) *Accuracy*	*(2)* *Dispersion*	*(3)* *Coverage*	*(4)* *Upgrade*	*(5)* *Downgrade*
Intercept	-0.035	0.011	-0.058***	-0.120***	-0.157***
	(-1.15)	(0.47)	(-2.63)	(-10.40)	(-13.00)
US EPU	-0.042**	-0.004	0.072***	-0.013*	0.008
	(-2.44)	(-0.29)	(5.67)	(-1.91)	(1.05)
ROA	0.342***	-0.230***	-0.067***	-0.032***	-0.047***
	(11.50)	(-9.53)	(-3.26)	(-2.76)	(-3.91)
Leverage	0.039*	-0.031*	-0.006	-0.007	-0.019**
	(1.73)	(-1.76)	(-0.34)	(-0.89)	(-2.42)
Smooth	-0.003*	0.001	0.001	-0.000	-0.000
	(-1.71)	(-0.92)	(-0.76)	(-0.10)	(-0.20)
Size	0.009***	0.014***	0.336***	0.045***	0.050***
	(2.91)	(5.40)	(143.40)	(36.20)	(38.80)
Sentiment	-0.029	0.032**	0.004	0.004	-0.001
	(-1.62)	(2.28)	(0.26)	(0.56)	(-0.20)
MKT Volatility	-0.010**	0.010	-0.010*	0.010	0.010
	(-2.36)	(1.20)	(-1.94)	(0.74)	(0.79)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	11,157	10,899	12,243	11,613	11,613
R^2	0.0204	0.0109	0.6653	0.1117	0.1245

Table 6: European economic policy uncertainty and analyst behaviors

This table presents the average estimated coefficients from regressions of measures of analyst behaviors on European EPU. All variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. T-statistics are in parentheses.

	(1) *Accuracy*	*(2)* *Dispersion*	*(3)* *Coverage*	*(4)* *Upgrade*	*(5)* *Downgrade*
Intercept	-0.046	0.033	0.038*	-0.099***	-0.131***
	(-1.63)	(1.48)	(1.85)	(-9.34)	(-11.90)
European EPU	-0.026**	-0.017**	-0.008	-0.026***	-0.012***
	(-2.35)	(-2.02)	(-1.00)	(-5.96)	(-2.67)
ROA	0.341***	-0.233***	-0.074***	-0.035***	-0.050***
	(11.50)	(-9.62)	(-3.59)	(-3.06)	(-4.14)
Leverage	0.039*	-0.040*	-0.015	-0.010	-0.022***
	(1.73)	(-1.94)	(-0.94)	(-1.25)	(-2.77)
Smooth	-0.003*	0.001	0.001	-0.000	-0.000
	(-1.69)	(0.92)	(0.71)	(-0.08)	(-0.21)
Size	0.010***	0.014***	0.337***	0.046***	0.051***
	(3.01)	(5.58)	(143.0)	(36.70)	(39.00)
Sentiment	-0.033*	0.034**	0.016	0.005	0.001
	(-1.81)	(2.42)	(1.19)	(0.76)	(0.18)
MKT Volatility	-0.010**	0.010	-0.010*	0.010	0.010
	(-2.58)	(1.11)	(-1.65)	(0.43)	(0.77)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	11,157	10,899	12,243	11,163	11,613
R^2	0.0204	0.0113	0.6645	0.114	0.125

Table 7: Global economic policy uncertainty and analyst behaviors

This table presents the average estimated coefficients from regressions of measures of analyst behaviors on global EPU around the world. All variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. T-statistics are in parentheses.

	(1)	*(2)*	*(3)*	*(4)*	*(5)*
	Accuracy	*Dispersion*	*Coverage*	*Upgrade*	*Downgrade*
Intercept	-0.045	0.037	0.024	-0.095***	-0.133***
	(-1.50)	(1.58)	(1.11)	(-8.51)	(-11.40)
Global EPU	-0.038**	-0.029**	0.002	-0.040***	-0.016**
	(-2.13)	(-2.04)	(0.14)	(-5.63)	(-2.10)
ROA	0.341***	-0.233***	-0.073***	-0.035***	-0.049***
	(11.5)	(-9.63)	(-3.52)	(-3.03)	(-4.10)
Leverage	0.040*	-0.034*	-0.014	-0.009	-0.022***
	(1.76)	(-1.94)	(-0.84)	(-1.20)	(-2.71)
Smooth	-0.003*	0.001	0.001	-0.000	-0.000
	(-1.68)	(0.93)	(0.71)	(-0.06)	(-0.20)
Size	0.010***	0.014***	0.336***	0.046***	0.051***
	(2.98)	(5.57)	(143.00)	(36.60)	(39.00)
Sentiment	-0.032*	0.035**	0.015	0.007	0.002
	(-1.75)	(2.48)	-1.09	-0.93	(0.20)
MKT Volatility	-0.010**	0.010	-0.010	0.010	0.010
	(-2.28)	(1.38)	(-1.62)	(1.22)	(1.08)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	11,157	11,276	12,243	11,613	11,613
R^2	0.0203	0.0112	0.6644	0.114	0.125

Table 8: Robust test

This table presents the average estimated coefficients from regressions of measures of analyst behaviors on U.K. EPU after geopolitical risk (GPR) and annual GDP growth (GDP growth) are controlled. All other variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. T-statistics are in parentheses.

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
	Accuracy	*Accuracy*	*Dispersion*	*Dispersion*	*Coverage*	*Coverage*	*Upgrade*	*Upgrade*	*Downgrade*	*Downgrade*
Intercept	-0.060**	-0.048	0.025	0.041	0.044**	0.062***	-0.119***	-0.100***	-0.132***	-0.125***
	(-2.27)	(-1.51)	(1.22)	(1.63)	(2.32)	(2.72)	(-12.1)	(-8.25)	(-12.8)	(-9.81)
UKEPU	-0.021*	-0.022*	-0.018*	-0.019*	0.001	-0.001	-0.030***	-0.032***	-0.021***	-0.022***
	(-1.68)	(-1.75)	(-1.82)	(-1.93)	(0.11)	(-0.05)	(-6.04)	(-6.30)	(-3.99)	(-4.07)
GPR	-0.102	-0.082	-0.046	-0.023	-0.249***	-0.221***	0.102***	0.128***	0.001	0.009
	(-0.95)	(-0.75)	(-0.59)	(-0.28)	(-3.32)	(-2.85)	(2.67)	(3.22)	(0.001)	(0.22)
GDP Growth		-0.003		-0.004		-0.005		-0.005**		-0.002
		(-0.67)		(-1.11)		(-1.42)		(-2.56)		(-0.91)
ROA	0.342***	0.343***	-0.232***	-0.231***	-0.077***	-0.076***	-0.031***	-0.030***	-0.049***	-0.049***
	(11.5)	(11.5)	(-9.58)	(-9.55)	(-3.71)	(-3.67)	(-2.66)	(-2.58)	(-4.08)	(-4.05)
Leverage	0.042*	0.042*	-0.033*	-0.032*	-0.015	-0.014	-0.007	-0.006	-0.022**	-0.021***
	(1.86)	(1.88)	(-1.86)	(-1.82)	(-0.93)	(-0.88)	(-0.94)	(-0.83)	(-2.72)	(-2.67)
Smooth	-0.003*	-0.003*	0.001	0.001	0.001	0.001	0.001	0.001	-0.001	-0.001
	(-1.67)	(-1.65)	(0.95)	(0.97)	(0.71)	(0.74)	(0.01)	(0.07)	(-0.16)	(-0.13)
Size	0.010***	0.009***	0.014***	0.014***	0.337***	0.337***	0.045***	0.045***	0.051***	0.051***
	(2.96)	(2.95)	(5.55)	(5.52)	(143.4)	(143.7)	(36.4)	(36.3)	(39.2)	(39.1)
Sentiment	-0.032*	-0.034*	0.036**	0.034**	0.006	0.003	0.017**	0.014*	0.007	0.006
	(-1.70)	(-1.77)	(2.46)	(2.29)	(0.42)	(0.23)	(2.29)	(1.93)	(0.96)	(0.83)
MKT Volatility	-0.001**	-0.001**	0.001	0.001	-0.001	-0.001	0.001	-0.001	0.001	0.001
	(-2.00)	(-2.09)	(1.52)	(0.91)	(-0.90)	(-1.41)	(0.80)	(-0.34)	(1.35)	(0.85)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	11,157	11,157	10,899	10,899	12,243	12,243	11,613	11,613	11,613	11,613
R^2	0.0202	0.0203	0.0112	0.0114	0.6647	0.6648	0.1146	0.1152	0.1256	0.1257