Investor sentiment and the economic policy uncertainty premium

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Abstract

Motivated by recent studies documenting an equity premium associated with economic policy uncertainty (EPU), we test the hypothesis that the EPU premium is stronger (weaker) following periods of low (high) investor sentiment. We estimate stock sensitivity to an economic policy uncertainty (EPU) index and show that stocks in the Australian equities market in the highest uncertainty beta tertile underperform stocks in the lowest tertile, similar to US stocks. However, we find that this negative uncertainty premium remains significant only following periods of low investor sentiment as it disappears following periods of high sentiment. Our results complement the US evidence in that uncertainty averse investors are willing to pay high prices for stocks with positive uncertainty beta and require extra compensation to hold stocks with negative beta, but only in low sentiment periods. These results are consistent with strong (weak) intertemporal hedging demand for positive EPU beta stocks in low (high) sentiment periods. It is also consistent with limited (full) participation of pessimistic investors and investors with high aversion to uncertainty in low (high) sentiment periods. Our results suggest that betting against EPU as a trading strategy would be relatively more profitable when executed during low sentiment periods.

Keywords: economic policy uncertainty, investor sentiment, cross-sectional stock returns, Australian stock market

1. Introduction

Studies have shown that uncertainty has implications not only on real economic activity but also on the consumption and investment decisions of economic agents (see for example, Bernanke, 1983; Dixit, 1989; Gomes et al. 2003; Bloom, 2009; Walsh and Tan, 2008; Allen et al. 2012; Dreschler, 2013; Jurado et al., 2015; Yang et al., 2019). Pástor and Veronesi (2012, 2013) present models on how government policy uncertainty affect stock pricies. In particular, Pastor and Veronesi (2013) develop a theoretical model where stock prices are driven not only by economic uncertainty but also by political uncertainty which is orthogonal to the former. Political uncertainty is broadly defined as uncertainty in the government's future policy choice. Using the economic policy uncertainty (EPU) index of Baker et al. (2012) as their proxy for political uncertainty, Pástor and Veronesi (2013) provide modest empirical evidence of their model's prediction that political uncertainty commands a risk premium which is stronger in weaker economic conditions.

In a subsequent study, Brogaard and Detzel (2015) show that EPU is distinct from general economic uncertainty as proxied by the volatility of market returns, though the two are positively correlated. More importantly, they find that EPU is priced in the cross-section of stock returns in U.S. equities. Using Baker et al.'s (2012) EPU index to measure economic policy uncertainty, they document a negative EPU premium, where stocks whose returns covary positively with EPU (ie., positive EPU beta stocks) underperform stocks whose returns covary negatively with EPU (ie., negative EPU beta stocks). In as much as stocks with positive EPU beta hedge against EPU, Brogaard and Detzel (2015) suggest that the negative EPU premium is consistent with investor preference for positive EPU beta stocks for hedging purposes. This hedging demand for positive uncertainty beta stocks causes investors to overpay for such stocks, leading to low subsequent returns.

In a related study, Bali et al. (2017) find that general economic uncertainty is also priced in the cross-section of stock returns as they document a negative economic uncertainty premium in the U.S. market. Analogous to Brogaard and Detzel (2015), they find that stocks whose returns covary positively with economic uncertainty (i.e., positive economic uncertainty beta stocks) underperform stocks whose returns covary negatively with economic uncertainty (i.e., negative uncertainty beta stocks). Bali et al. (2017) also report that the uncertainty premium is higher during recessions and periods of high uncertainty. In addition to suggesting that the negative economic uncertainty premium is consistent with intertemporal hedging demand for stocks with positive economic uncertainty beta, Bali et al. (2017) also posit that the negative uncertainty premium could be explained by limited participation of pessimistic investors and investors with a high aversion to uncertainty. If investors who are highly uncertainty-averse or have pessimistic ambiguity expectations choose to limit or otherwise cease their participation in the market if economic uncertainty is sufficiently high, stocks with high uncertainty beta would be held only by optimistic investors or investors with a low aversion to economic uncertainty. Hence positive uncertainty beta stocks will only require a low uncertainty premium, leading to low expected returns.

To the extent that the negative EPU premium is driven by intertemporal hedging demand and/or by limited market participation, we postulate that the EPU premium is conditioned by investor sentiment. We suggest that hedging demand for positive uncertainty beta stocks is stronger (weaker) during periods of low (high) investor sentiment, therefore we expect the negative uncertainty premium to be stronger (weaker) following periods of low (high) investor sentiment. Likewise, we suggest that pessimistic investors and investors with high uncertainty aversion will more likely choose to limit or cease their market participation during periods of low rather than during periods of high sentiment. To the extent that the negative uncertainty premium is driven by limited market participation of pessimistic and highly uncertainty-averse investors, we also expect the negative uncertainty premium to be stronger (weaker) following periods of low (high) investor sentiment.

We test our hypothesis in the Australian stock market as it is an important market in the Asia-Pacific region with a market capitalization of A$1.6 trillion and an average turnover of A$5.6 billion with 1.3 million trades a day (ASX, 2017). There are also 11.2 million retail investors in Australia or 60% of the adult population (ASX, 2017) who could particularly be susceptible to behavioural biases and more easily affected by investor sentiment. More importantly, Australian political history suffered a tumultuous state of affairs that is unique among the world's developed countries in the last 10 years (Smales, 2016). For example, during this period Australia had three government changes, in addition to two more additional changes of Prime Ministers following party infighting. Smales (2016) further suggests that beyond the changes of the political leaders, the Australian Parliament was forced to change the Federal budget and the tax system, which is the first hung Parliament since World War II. Therefore, we are interested in examining how these changes in the economic policies have impacted Australian stock values. We measure economic policy uncertainty using the Australian EPU index obtained from the website of Scott R. Baker, Nick Bloom and Steven J. Davis. We examine both the unconditional EPU premium as well as the EPU premium conditioned by investor sentiment. We measure investor sentiment using the Australian Consumer Confidence Index (CCI). Each month we estimate EPU beta (β^{EPU}) for each stock using 24-month rolling regressions. We then sort stocks into tertile portfolios at the beginning of the month based on their EPU beta in the previous month and examine their returns in the current month. We find a negative unconditional EPU premium similar to that in the US markets. Specifically, we find that stocks in the lowest EPU beta tertile outperform stocks in the highest tertile by 1.26% per month on a risk-adjusted basis (seven-factor alpha). More importantly, consistent with our hypotheses, we find that the negative EPU premium is stronger (weaker) following periods of low (high) investor sentiment. We classify a month as a high (low) sentiment period when the CCI for that month is above (below) the median CCI for the sample period. The negative EPU premium remains significant following low sentiment periods but it disappears following high sentiment periods. In particular, stocks in the lowest EPU beta tertile outperform stocks in the highest tertile by 1.81% per month following low sentiment periods on a risk-adjusted basis (seven-factor alpha). In contrast, though the difference in the risk-adjusted returns of low and high EPU beta portfolios following high sentiment periods is still negative, it is not statistically. Moreover, we find that the negative EPU premium following low sentiment periods is driven by the outperformance (underperformance) of stocks with negative (positive) uncertainty beta similar to that in the US. Our results suggest that investors in the Australian stock market exhibit a preference for positive uncertainty beta stocks bidding their prices up, resulting in lower expected returns, but only in low sentiment periods. This is consistent with a stronger (weaker) intertemporal hedging demand for positive uncertainty beta stocks in low (high) sentiment periods. Our results are also consistent with limited (full) participation of pessimistic and highly uncertainty-averse investors in low (high) sentiment periods.

As a robustness test, we also employ Fama-MacBeth (1973) regressions and control for size, book-to-market (BM), momentum (MOM), short-term reversal (REV), idiosyncratic volatility (IVOL), illiquidity (ILLIQ), demand for lottery-like stocks (MAX), total volatility (TV), growth of total assets (IA), profitability (ROE), and closing price (CP). The unconditional negative relation between EPU beta and future returns remains statistically significant in these regressions. Further, we also augment the Fama-MacBeth regression models with dummy variables for high and low sentiment and include two interaction terms, one between the high dummy and EPU beta and one between the low dummy and EPU beta. The negative relation between EPU beta and future returns following low sentiment periods remains statistically significant. Finally, we use a global EPU index from Baker, Bloom and Davis' website to replace the current Australian EPU index, and re-perform our regressions. Results consistently support our main findings.

Our paper contributes to the literature as follows. First, we add to the growing cross-country literature confirming the role of EPU in the cross-sectional pricing of equities. Second, we show that the EPU premium is conditioned by investor sentiment and therefore complements the U.S. results. We show that the EPU premium in Australia is negative, as in the U.S. markets, following low sentiment periods but it turns insignificant following high sentiment periods. We suggest that this result could be due to a strong hedging demand for positive beta stocks in low sentiment periods, but that this hedging demand appears to weaken in high sentiment periods. Our results are also consistent with limited market participation of pessimistic investors and investors with a high aversion to uncertainty in low sentiment periods but not in high sentiment periods. Our results also imply that betting against EPU beta as a trading strategy would be relatively more profitable when executed during low sentiment periods.

Section 2 reviews the relevant literature and develops our hypotheses. Section 3 reports the data and methodology of this study. Section 4 presents the empirical results and the last section concludes.

2. Motivation and hypothesis development

Brogaard and Detzel (2015) find that economic policy uncertainty (EPU) is priced in the cross-section of equities in the U.S. markets. They define EPU as uncertainty about fiscal, regulatory, or monetary policy, caused by government policymakers. Using the Baker et al. (2012) EPU index as their measure of policy uncertainty, they showed for 25 Fama-French size-momentum portfolios, that innovations in EPU earn a negative uncertainty premium. They report that the portfolio with the lowest EPU beta outperforms the portfolio with the highest EPU beta by 5.53% per annum. The negative uncertainty premium suggests that uncertainty-averse investors require a return premium to hold stocks with negative uncertainty beta, while they are willing to pay high prices for stocks with positive uncertainty beta. Brogaard and Detzel (2015) suggest that the negative EPU premium is consistent with intertemporal hedging demand in the context of the Merton's (1973) Intertemporal Capital Asset Pricing Model (ICAPM). Inasmuch as an increase in economic uncertainty causes an unfavourable shift in the investment opportunity set, economic agents can hedge or otherwise compensate for this loss by holding stocks whose returns increase with uncertainty, ie., positive uncertainty beta stocks. As investors prefer stocks with positive uncertainty beta, they are willing to bid their price up and consequently accept lower expected returns.

In a related study, Bali et al. (2017) report that general economic uncertainty also plays a role in the cross-sectional pricing of individual stocks and equity portfolios in the U.S. markets. They measure economic uncertainty using the Jurado et al. (2015) index, which is defined as the conditional volatility of the unforecastable component of a large number of economic variables. Bali et al. estimate stock exposure (beta) to the Jurado et al. economic uncertainty index and form decile portfolios. They report a negative uncertainty premium that is analogous to Brogaard and Detzel's (2015) negative EPU premium, wherein stocks in the lowest uncertainty beta decile (i.e., stocks with negative uncertainty beta) outperform stocks in the highest decile (i.e., stocks with positive uncertainty beta) by 6% in risk-adjusted returns (seven-factor alpha) per annum. Bali et al. (2017) offer three explanations for the negative uncertainty premium. First, similar to Brogaard and Detzel (2015), they argue that the negative uncertainty premium is consistent with intertemporal hedging demand. A second explanation is motivated by the extant literature on uncertainty aversion and two-stage utility theory (for example, Schmeidler, 1989; Segal, 1987, 1990; Epstein, 1999; Nau, 2006; Ergin and Gul, 2009; Conte and Hey, 2013). As economic uncertainty enters an individual's utility function, stocks with low uncertainty beta would require a higher return than stocks with high uncertainty beta, hence the negative uncertainty premium. A third explanation relates to limited market participation of certain types of investors contingent on market conditions (for example, Uppal and Wang, 2003; Cao et al., 2005; Chapman and Polkovnichenko, 2009; and Bossaerts et al., 2010). Investors who are highly uncertainty-averse or have pessimistic ambiguity expectations may choose to limit or otherwise cease their participation in the market if economic uncertainty is sufficiently high. As a result, high uncertainty beta stocks could be held only by optimistic investors or those with low uncertainty aversion who require a low uncertainty premium, hence the low returns for high uncertainty beta stocks.

Interestingly, outside the U.S. market, Li (2017) documents a positive (not negative) EPU premium in China which he attributes to risk-seeking behaviour among Chinese investors. The positive EPU premium implies that risk-seeking Chinese investors require a return premium to hold stocks with positive uncertainty beta, while they are willing to pay high prices for stocks with negative uncertainty beta. The upside (downside) of holding positive uncertainty beta stocks occurs when uncertainty increases (decreases) as their return also increase (decrease). While the upside (downside) of holding negative beta stocks occurs when uncertainty decreases (increases) as their return increase (decrease). Li argues that the preference among Chinese investors for negative over positive beta stocks could be due to them overweighting (underweighting) the upside (downside) of holding negative uncertainty beta stocks while overweighting (underweighting) the downside (upside) of holding positive uncertainty stocks.[1]

While the U.S. and Chinese evidence respectively indicate a positive and negative unconditional EPU premium, we suggest that the EPU premium is conditioned by investor sentiment. Periods of low (high) investor sentiment could generally be characterized as a period of high (low) uncertainty, a general pessimistic (optimistic) mood among investors, or low (high) investor propensity to speculate. To the extent that the negative EPU premium is driven by intertemporal hedging demand for relatively safe stocks whose returns covary positively with economic policy uncertainty, we suggest that this hedging demand will be stronger (weaker) during periods of low (high) investor sentiment. A strong (weak) demand for positive EPU beta stocks bids up (down) their price resulting in low (high) subsequent returns relative to stocks with negative EPU beta following periods of low (high) investor sentiment. Hence, we expect the negative EPU premium to be stronger (weaker) following low (high) investor sentiment.

In addition, we suggest that pessimistic and uncertainty-averse investors would be more (less) likely to limit their participation in periods of low (high) investor sentiment. To the extent that the negative EPU premium is driven by limited participation of pessimistic investors and investors with a high aversion to uncertainty, we also expect the negative EPU premium to be stronger (weaker) following periods of low (high) investor sentiment. During periods of low investor sentiment, high EPU beta stocks would more likely be held by optimistic investors who only require low uncertainty premium, hence the low subsequent returns of high EPU beta stocks

[1] In a related study, Yang et al. (2019) find negative relation between EPU beta and the firm's market value. They suggest that this implies that Chinese investors reduce their valuation of firms with high EPU beta and consequently have a higher demand firms with low EPU beta. In an earlier study, Chen et al. (2017) find that EPU negatively predicts future aggregate stock market returns in China at various horizons. However they do not consider the relation between EPU beta and stock returns.

relative to low EPU beta stocks giving rise to the negative EPU beta premium. In periods of high investor sentiment, we expect full participation of all investors, hence a weaker negative EPU premium. In sum, we test the following hypotheses:

Hypothesis 1: The unconditional EPU premium is negative.

Hypothesis 2: The negative EPU premium is stronger (weaker) following periods of low (high) investor sentiment.

3. Data and Methods

3.1 Data Collection

Our sample stocks include all common stocks traded on the ASX from January 2009 through June 2018. The daily and monthly stock return index and data on firm characteristics, e.g., capitalization, market-to-book value, monthly closing price, return on equity, total equity, and total investment, are obtained from Thomson Reuters DataStream. DataStream computes the stock returns by using the changes of the stock return index from the last to the current period. There are three situations when a stock might have a zero-return: 1) no change in stock price from month t to month $t+1$; 2) the stock is not traded in a particular month; and 3) the stock has been delisted from a particular month. We follow Ince and Porter (2006) and include only traded stocks in our sample. We winsorize all data between 1% and 99% to ensure that our empirical results are not unduly influenced by outliers. We have 552 stocks in January 2009, which increases to 668 stocks in June 2018. We have 76,497 monthly return observations and a total of 9.8 million daily return observations. On average, there are 671 stocks each month. We use the Australian official cash rate obtained from DataStream, to represent the risk-free rate. Market returns are the value-weighted returns of all firms in the sample.

3.2 Measuring economic policy uncertainty

Australia's monthly news-based EPU index is obtained from the website of Baker, Bloom and Davis (https:\\www.policyuncertainty.com) for the period between January 2009 and June 2018 (see Baker, et al., 2016 for a more detailed description of news-based EPU indices). The index is constructed from EPU-related articles from eight Australian newspapers: Daily Telegraph, Courier Mail, The Australian, The Age, The Advertiser, Mercury, Sydney Morning Herald, and The Herald Sun. For each paper, they select all articles involving the keywords "uncertainty" or "economy". Then they check whether these sample articles are related to policy terms: regulation, Reserve Bank of Australia (RBA), deficit, tax, taxation, taxes, parliament, senate, cash rate, legislation, tariff, and war. The EPU rate is standardized to the unit standard deviation. Finally, the standardized series are rescaled so that the EPU index has a mean of 100.

For robustness tests, we also use Baker, Bloom and Davis' Global EPU index. The global monthly EPU is a GDP-weighted average of national EPU indices of 20 countries[2]. First, the national EPU index from 20 countries is normalized. Then each national EPU index is weighted by their respective GDP. We obtain the Global EPU index from Baker, Bloom and Davis's website for the period between January 2009 and June 2018.

Figure 1 shows the time-series of the Australian EPU index and Global EPU index. The Australian EPU index was relatively stable from 1998 to 2007, as no major changes had taken place in Australian economic policy. However, 2008 to 2017 was characterised by a series of variations in Australian economic policies as the country was led by five different prime ministers.

[2] The Global EPU index covers 20 countries including Australia, Brazil, Canada, Chile, China, France, Germany, Greece, India, Ireland, Italy, Japan, Mexico, the Netherlands, Russia, South Korea, Spain, Sweden, the United Kingdom, and the United States.

We observe peaks in the Australian EPU in 2008 and 2011, which respectively coincide with the 2008 global financial crisis and the Euro debt crisis. The spike in the Australian EPU in 2016 coincides with it being an election year. The Global EPU index is on average higher than the Australian EPU index, possibly caused by the high economic policy uncertainty in emerging economies.

[Insert Figure 1 about Here]

3.3 Estimating EPU beta

We follow Bali et al. (2017) in estimating the monthly EPU beta for each Australian stock during the sample period. To do this, we employ a 24-month rolling regression of excess stock returns on the log of the EPU index along with several control variables expressed in the following model:

$$\mathrm{R}_{i,t} = \alpha_{i,t} + \beta_{i,t}{}^{epu}\mathrm{logEPU}_t + \beta_{i,t}{}^{MKT}\mathrm{MKT}_t + \beta_{i,t}{}^{SMB}\mathrm{SMB}_t + \beta_{i,t}{}^{HML}\mathrm{HML}_t + \beta_{i,t}{}^{UMD}\mathrm{UMD}_t + \beta_{i,t}{}^{LIQ}\mathrm{LIQ}_t + \beta_{i,t}{}^{R_{I/A}}\mathrm{R}_{I/A,t} + \beta_{i,t}{}^{R_{ROE}}\mathrm{R}_{ROE,t} + \varepsilon_{i,t}$$

where $\mathrm{R}_{i,t}$ is the excess return of firm *i* at time *t*; logEPU is the log of the Australian EPU index; MKT is the excess market returns; SMB is the size factor defined as the stock returns of small over big capitalization firms; HML is the value factor defined as the stock returns of high over low book-to-market ratio firms (Fama & French, 1992, 1993); UMD is defined as the stock returns of high over low momentum firms (Carhart, 1997); and LIQ is defined as the stock returns of the most liquid over the most illiquid stocks (Pástor and Stambaugh, 2003). Following Hou et al. (2015), $\mathrm{R}_{I/A}$ is the investment factor defined as the stock returns of firms with high total investment rate over firms with low total investment rate; R_{ROE} is the profitability factor defined as the stock returns of firms with high over firms with low return on equity.

3.4 Proxy of Australian investor sentiment

Investor sentiment reflects the combined expectations and beliefs of investors on the fundamentals of the economy and markets (Brown and Cliff, 2004; Baker and Wurgler, 2006). Periods of low (high) investor sentiment could generally be characterized as a period of high (low) uncertainty, a general pessimistic (optimistic) mood among investors, or low (high) investor propensity to speculate. Lemmon and Portniaguina (2006) and Qiu and Welch (2007) argue that the changes in consumer confidence index (CCI) can successfully predict variations in the stock prices and that it is a relatively reliable measure of investor sentiment. Hence, we use the Australian CCI as our proxy for investor sentiment. We collect the Australian CCI from the OECD database from January 2009 and June 2018. Then we classify each month in the sample as a high (low) sentiment month if the CCI is above (below) the median CCI over the sample period.

3.5 Portfolio formation and Fama–MacBeth regressions

To examine the relationship between EPU beta and one-month ahead raw returns, we perform portfolio-sorting and stock-level Fama–MacBeth two-stage cross-sectional regressions. At the beginning of each month, firms are sorted into tertiles according to their EPU beta in the previous month. Then we examine each portfolio's equal- and value-weighted raw returns for the current month, reforming portfolios every month. We also estimate each portfolio's alpha (α coefficient) from 3 different models: 1) Fama-French (1993) three-factor model (MKT, SMB, and HML), 2) the Carhart (1997) four-factor model (MKT, SMB, HML, and UMD) and 3) the Bali et al. (2017) seven-factor model (MKT, SMB, HML, UMD, LIQ, $R_{I/A}$, and R_{ROE}).

As the portfolio-sorting procedure cannot simultaneously examine the impact of EPU beta on stock returns while controlling for a set of variables, we also employ the Fama-Macbeth two-stage regressions. We run the regression between monthly excess return and lagged EPU beta while controlling for firm size (SIZE), book-to-market ratio (BM), momentum (MOM), short-term reversal (REV), demand for lottery stocks (MAX), illiquidity (ILLIQ), idiosyncratic volatility (IVOL), total volatility (TV), investment rate in total assets (I/A), profitability (ROE), and closing price (CP)[3]. All the control variables are lagged one period and are defined in Appendix 1. We estimated the following model and its nested versions:

$$
\begin{aligned}
R_{i,t} = \lambda_{0,t-1} + \lambda_{1,t-1}\beta_{i,t-1}{}^{EPU} + \lambda_{2,t-1}SIZE_{i,t-1} + \lambda_{3,t-1}BM_{i,t-1} + \lambda_{4,t-1}MOM_{i,t-1} \\
+ \lambda_{5,t-1}REV_{i,t-1} + \lambda_{6,t-1}MAX_{i,t-1} + \lambda_{7,t-1}ILLIQ_{i,t-1} + \lambda_{8,t-1}IVOL_{i,t-1} \\
+ \lambda_{9,t-1}TV_{i,t-1} + \lambda_{10,t-1}I/A_{i,t-1} + \lambda_{11,t-1}ROE_{i,t-1} + \lambda_{12,t-1}CP_{i,t-1} \\
+ \varepsilon_{i,t} \qquad (2)
\end{aligned}
$$

4. Empirical Results

4.1 Descriptive Statistics and Characteristics Analysis

Table 1 shows the descriptive statistics of our test variables. The mean values of the Australian and Global EPU betas reported in the first two columns are very similar at 0.4706 and 0.4722, respectively. Mean stock returns are 0.89% per month. Table 1 also reports the mean values of 11 control variables. The means of size and BM are 19.0902 and 0.8104, respectively, which suggests that most firms in our sample are large firms. The mean values of both MOM and REV are positive, which are 0.0014 and 0.0100 respectively and are consistent with the existing literature (Zhong and Gray, 2016). The mean of IVOL is 0.0342, which is lower than the IVOL in the Australian stock market reported by Cao et al. (2018). The average MAX of Australian stocks

[3] As a robustness test, we also run the regression between monthly stock return and lagged EPU beta while controlling for other control variables. Results are qualitatively the same as when we use the monthly excess return as dependent variable. We do not report these results due the space constraints. However, results are available upon request.

is 0.0766 per month, which is lower than Zhong and Gray's (2016) result of 0.1182. Means of ILLIQ and ROE are 0.0021 and -0.0692, respectively. The average TV is 0.0355, which is very close to the value of IVOL indicating that almost all total volatility is idiosyncratic. Finally, the average price of Australian firms is $1.3386, which is slightly lower than Cao et al.'s (2018) figure of $1.68[4].

[Insert Table 1 about here]

Table 2 reports the correlation matrix of our test variables. The Australian and Global EPU betas are highly correlated with a correlation coefficient of 0.93. Both EPU betas are negatively correlated with SIZE, MOM, REV, ROE, and PRICE, while they are positively correlated with BM, MAX, IVOL, ILLIQ, TV, and IA. These results indicate that stocks with high Australian and Global EPU betas are big stocks, are losers in the past 11 months, losers in the past month, unprofitable, low priced, have high book-to-market ratio, high maximum daily return, high idiosyncratic volatility, high illiquidity, high total volatility, and high levels intangible assets.

[Insert Table 2 about here]

Table 3 tests the persistence of the Australian EPU beta by running Fama-MacBeth two-stage regressions of future β^{EPU} in month *t+6* and future β^{EPU} in month *t+12* on β^{EPU} in month *t* while controlling for firm characteristics in month *t*. We use the following model to test the persistence of β^{EPU} by following Bali et al. (2017):

$$\boldsymbol{\beta}^{\mathbf{EPU}}_{\mathbf{i,t+h}} = \boldsymbol{\lambda}_{\mathbf{0,t}} + \boldsymbol{\lambda}_{\mathbf{1,t}} \boldsymbol{\beta}^{\mathbf{EPU}}_{\mathbf{i,t}} + \boldsymbol{\lambda}_{\mathbf{2,t}} \mathbf{X}_{\mathbf{i,t}} + \boldsymbol{\varepsilon}_{\mathbf{i,t}} \qquad \mathbf{(3)}$$

[4] The mean values of MKT, SMB, HML, and UMD from the Carhart (1997) four-factor model are 0.0051, -0.0031, 0.0420, and 0.0116 respectively. The mean liquidity premium is -0.0007, which suggests that the most liquid stocks underperform the most illiquid stocks in the Australian stock market, but our estimated values are contradictory to those in Pástor and Stambaugh (2003) for the U.S. stock markets. The mean of $R_{I/A}$ and R_{ROE} are -0.0054 and -0.0380 per month respectively. These results can be found in Appendix 2.

where $\beta^{EPU}_{i,t+h}$ is the EPU beta of stock *i* in month *t+h,* where *h* equals 6 or 12; $\beta^{EPU}_{i,t}$ is the EPU beta of stock *i* in month *t*; and $X_{i,t}$ is a collection of control variables in month *t*.

The first and third columns of Table 3 show the univariate regression results, while the second and fourth columns show the multivariate regression results with 11 control variables defined in Appendix 1. In the first and third columns, the coefficient of β^{EPU} in month *t* is positive and highly significant. The coefficient of β^{EPU} remains positive and highly significant in the multivariate regressions reported in columns two and four. Our results indicate that β^{EPU} is highly persistent. Stocks with high β^{EPU} tend to also have high β^{EPU} in the following 6 and 12 months.

[Insert Table 3 about here]

Table 4 shows the characteristics of β^{EPU}-sorted portfolios. The bottom row shows that stocks with high β^{EPU} are smaller, have a higher BM, lower returns in the past 11 months, higher maximum daily return, higher idiosyncratic volatility, more illiquid, higher total volatility, higher investment rate in total assets, less profitable and lower price, compared with stocks with low β^{EPU}. These results are consistent with the correlation coefficients reported in the first column of Table 2.

[Insert Table 4 about here]

We also examine the relation between EPU beta and several firm characteristics through Fama and MacBeth (1973) cross-sectional regressions. We estimate the following model with its nested versions and report the results in Table 5:

$$\beta^{EPU}_{i,t} = \lambda_{0,t} + \lambda_{1,t} X_{i,t} + \varepsilon_{i,t} \qquad (4)$$

where $\beta^{EPU}_{i,t}$ is the EPU beta of stock *i* in month *t* and $X_{i,t}$ is a collection of control variables for stock *i* in month *t*. The univariate regressions in Table 5 show significant slope coefficients for all of our control variables except for REV, consistent with the portfolio-sorting results reported in Table 4. The last column of Table 5 reports the multivariate regression results, which includes all the control variables. We find that only BM, MAX, IVOL, TV, IA, ROE, and PRICE remain significantly related to β^{EPU}. This indicates that stocks with high uncertainty beta have high book-to-market ratio, high maximum daily return, high idiosyncratic volatility, high total volatility, high intangible assets, low profitability, and low price. Our finding is somewhat similar to that of Bali et al. (2017) who find after controlling for all variables, the cross-sectional relations of most of their variables become insignificant.

[Insert Table 5 about here]

4.2 Unconditional EPU premium

Table 6 shows excess and the risk-adjusted returns (α coefficient) of portfolios sorted on β^{EPU}. The risk-adjusted returns are alphas from the Fama-French three-factor model (1993), the Carhart four-factor model (1997), and Bali et al.'s seven-factor model (2017). The low-β^{EPU} tertile has a negative EPU beta of -1.67 while the high-β^{EPU} tertile has a positive EPU beta of 2.82 which indicates that returns of the low (high) EPU beta tertile are expected to covary negatively (positively) with EPU. This suggests that the low (high) EPU beta tertile is a relatively risky (safe) portfolio in relation to economic policy uncertainty. Panels A and B show the results from equal-weighted and value-weighted portfolios, respectively. Panel A shows a highly significant equal-weighted excess return spread between high- and low-β^{EPU} stocks of -0.57% per month. The respective 3-factor, 4-factor, and 7-factor alpha spreads are -1.33%, -1.32%, and -1.26% per month, respectively and all highly significant. Panel B likewise shows a highly significant value-weighted excess return spread between high- and low-β^{EPU} stocks of -0.59% per month. The respective 3-factor, 4-factor, and 7-factor alpha spreads are -1.41%, -1.40%, and -1.32% per month, respectively and all highly significant. Our results suggest a negative unconditional EPU equity premium similar with the findings of Brogaard and Detzel (2015) in the U.S. equities market but contrary to the findings of Li (2017) in the Chinese equities market. These unconditional results suggest a preference among Australian investors for positive over negative EPU beta stocks similar to U.S. investors.

[Insert Table 6 about here]

Table 7 examines the relationship between the current excess stock returns and the lagged β^{EPU} in univariate, bivariate, and multivariate tests. We used the following model to conduct Fama-MacBeth two-stage regressions analogous to the model of Bali et al. (2017):

$$\mathbf{R_{i,t} = \lambda_{0,t-1} + \lambda_{1,t-1}\beta^{EPU}_{i,t-1} + \lambda_{2,t-1}X_{i,t-1} + \varepsilon_{i,t}} \qquad \textbf{(5)}$$

where $R_{i,t}$ is the excess return of stock *i* in month *t*; $\beta^{EPU}_{i,t-1}$ is the EPU beta of stock *i* in month *t-1*; and $X_{i,t}$ is a collection of control variables for stock *i* at time *t-1*.

The first column shows that the slope coefficient from the univariate regression of current excess returns on lagged β^{EPU} is -0.0015 (t-statistics=-2.94), indicating a significantly negative relationship between stock excess returns and lagged β^{EPU} and supportive of the negative EPU beta premium from the univariate portfolio sorts. From column 2 to column 12, the slope coefficients of β^{EPU} from 11 bivariate regressions still remain negative and significant. The last column shows the result from the multivariate regression including all control variables. The average slope coefficient of β^{EPU} is -0.0015 with a t-statistic of -3.49. The significantly negative relationship between current excess returns and lagged β^{EPU} is in accord with the negative EPU beta premium in the unconditional portfolio sorting results reported in Table 6[5].

[Insert Table 7 about here]

As an additional robustness test, we also use Global EPU beta in place of the Australian EPU beta and perform univariate portfolio sorts and Fama-MacBeth regressions. The univariate portfolio sorting results reported in Table 8 are similar to those reported in Table 6 where we employed the Australian EPU as our measure of economic policy uncertainty. Table 8 confirms the negative EPU premium for both excess and risk-adjusted returns. Table 9 reports the results of the Fama-MacBeth regressions. Our results are similar to those reported in Table 7. The negative and significant coefficient of β^{GEPU} in the univariate, bivariate, and multivariate regressions confirm the negative relation between EPU beta and expected excess returns.

[Insert Table 8 about here]

[Insert Table 9 about here]

4.3. EPU premium conditioned on investor sentiment

Next, we condition the EPU premium on investor sentiment. First, we divide the sample months into high and low sentiment periods according to the value of the Australian CCI. A month is classified as high (low) sentiment period if the CCI in that month is above (below) the median CCI over the sample period. Then we sort stocks according to EPU beta and form tertile portfolios

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[5] As a robustness test, we sort the sample stocks using our control variables into three groups and re-estimate Model 5 within each group. For example, we sort all sample stocks by size into three groups, with cut-off points at the bottom 33.33%, medium 33.33% and top 33.33% of the value of SIZE. Then we estimate Model 5 in each SIZE group. We replicate this method for all other control variables. We find that the negative relationship between the β^{EPU} and expected stock returns are only significant for firms with high MAX, high illiquidity ratio, high TV, but low ROE and past 11-month losers. We do not report these results due to the space limitations. However, results are available upon request.

in each of the two sentiment sample periods. We report the results in Table 10. Table 10 shows excess and the risk-adjusted returns (α coefficient) of portfolios sorted by β^{EPU}. The risk-adjusted returns are alphas from the Fama-French three-factor model (1993), the Carhart four-factor model (1997), and Bali et al.'s seven-factor model (2017). Panels A and B report results in the low and high sentiment periods, respectively.

Consistent with hypothesis 2, our results show that the EPU premium is clearly conditioned by investor sentiment. Panel A shows that the EPU premium is significantly negative following low sentiment periods. The equal-weighted excess return spread between high- and low-β^{EPU} stocks is significantly negative at -0.82% per month. The respective 3-factor, 4-factor, and 7-factor alpha spreads are also significantly negative at -1.86%, -1.92%, and -1.81% per month, respectively. The corresponding value-weighted excess return spread between high- and low-β^{EPU} stocks is also significantly positive at 0.83% per month. The respective 3-factor, 4-factor, and 7-factor alpha spreads are also significantly positive at -1.91%, -1.96%, and -1.82% per month, respectively. The negative EPU premium is driven by the outperformance (underperformance) of the low-β^{EPU} (high-β^{EPU}) stocks as indicated by their significant equal- and value-weighted raw and adjusted returns.

In sharp contrast, Panel B shows that the EPU premium is significantly weaker following high sentiment periods. Our results indicate that while the EPU premium remains negative following high sentiment periods, it is no longer statistically significant. The equal-weighted excess return spread between high- and low-β^{EPU} stocks is -0.13% per month but not statistically significant. The respective 3-factor, 4-factor, and 7-factor alpha spreads are also negative at -0.24%, -0.13% and -0.31% per month, respectively, but all statistically insignificant. The corresponding value-weighted excess return spread between high- and low-β^{EPU} stocks is negative at -0.16% per month but statistically insignificant. The respective 3-factor, 4-factor, and 7-factor alpha spreads are also negative at -0.39%, -0.27% and -0.45% per month, respectively, all statistically insignificant.

[Insert Table 10 about here]

Table 11 reports the results of the Fama-MacBeth regressions in different sentiment periods. Panel A (B) reports the regression results in low (high) sentiment periods. Our results are consistent with results reported in Table 10. The coefficients of β^{EPU} in the univariate, bivariate, and multivariate regressions are negative and only significant in low sentiment periods but turn insignificant during the high sentiment periods.

[Insert Table 11 about here]

Furthermore, we create an interaction term between the EPU beta and a dummy variable, where the dummy equals 1 if a month is in a low (high) sentiment period, otherwise 0. We use the same method to sort low (high) sentiment period as introduced in Table 10 and report the results in Table 12. Columns (1) and (2) report results for low sentiment periods while columns (3) and (4) report results for high sentiment periods. The coefficients of β^{EPU} in both columns (1) and (2) remain significantly negative. More importantly, the interaction term between the β^{EPU} and the dummy variable for low-sentiment is also negative and statistically significant. The result suggests that the negative relationship between the β^{EPU} and expected excess stock returns is more pronounced in low sentiment periods. Results in columns (3) and (4) also show statistically significant negative coefficients of β^{EPU}. However, the interaction term between the β^{EPU} and the dummy variable for high-sentiment in column (4) is negative but statistically insignificant. The result indicates that the high sentiment dummy does not have any effect on the negative relationship between the β^{EPU} and expected excess stock returns[6].

[Insert Table 12 about here]

Finally, we also divided our sample months into three groups with cut-off points at the bottom 33.33%, medium 33.33%, and top 33.33% of the value of the Australian CCI. Then we conducted monthly Fama-MacBeth regressions using model 5. We report the results in Panel A of Table 13. The results are consistent with the univariate portfolios sorts. The coefficient of β^{EPU} is significantly negative for the low sentiment months but insignificant in high sentiment months. These results imply that in low sentiment months, β^{EPU} negatively predicts subsequent excess returns, with high (low) β^{EPU} stocks having low (high) returns in the subsequent month. However, there is no such predictability in high sentiment months.

[Insert Table 13 about here]

We conjecture that investor sentiment is low (high) when Australian EPU is high (low). Indeed, we find that logEPU is negatively correlated with Australian CCI with a correlation coefficient of -0.46. Figure 2 plots Australian EPU and Australian CCI. So as an additional robustness test, we use Australian EPU instead of Australian CCI to divide our sample months into three groups and then we perform monthly Fama-MacBeth regressions of expected stock returns on β^{EPU} and our control variables. We report the results in Panel B of Table 13. Consistent with the results reported in Panel A, we find the coefficient of β^{EPU} to be significantly negative in high EPU periods (low sentiment) but insignificant in low EPU periods (high sentiment).

[6] We also replace the Australian EPU beta with the Global EPU beta and replicate our analyses from Tables 11 to 13. Results are qualitatively the same as what we report from Tables 11 to 13. We do not report these results due the space limitations,but they are available upon request.

In sum, consistent with our second hypothesis, we document a strong negative EPU premium following low sentiment periods, but a weak and insignificant negative EPU premium following high sentiment periods. To the extent that low sentiment periods are associated with high uncertainty, these results are broadly consistent with Bali et al. (2017) who report that the economic uncertainty premium in the U.S. is higher during recessions and periods of high uncertainty. Our results suggest that investors in the Australian stock market exhibit a preference for positive uncertainty beta stocks in low sentiment periods. Investors bid up the price of such stocks which results in low subsequent returns which then leads to a negative EPU premium. Such preference is absent however in high sentiment periods, hence the insignificant EPU premium. Moreover, the negative EPU premium appears to be driven by the underperformance (outperformance) of stocks with positive (negative) uncertainty beta following low sentiment periods.

Our results are consistent with a strong (weak) hedging demand for positive EPU beta stocks during low (high) sentiment periods. It is also consistent with limited (full) participation of pessimistic investors and investors with a high aversion to uncertainty during low (high) sentiment periods.

5. Conclusion

In this paper, we examine the role of the economic policy uncertainty (EPU) in the pricing of Australian equities. In particular, we focus on the role of investor sentiment in conditioning the EPU premium. We measure EPU using the news-based Australian EPU index from the website of Baker, Bloom, and Davis. For robustness tests we also use Baker, Bloom and Davis' Global EPU index. We proxy investor sentiment with the Australian Consumer Confidence Index and we find that the EPU premium exclusively follows low sentiment periods. For robustness tests we also use the Australian EPU index as a proxy for investor sentiment. We estimate stock sensitivity to the EPU index and find that the resulting EPU betas are negatively related to subsequent stock returns, similar to the U.S. markets. In particular, in univariate portfolio-level analysis, we find that stocks in the highest EPU beta tertile underperform stocks in the lowest tertile by 1.26% per month on a risk-adjusted basis (7-factor alpha). More importantly, conditioning on investor sentiment we find that the EPU premium is stronger (weaker) following periods of low (high) investor sentiment. Our results show that stocks in the highest EPU beta tertile underperform stocks in the lowest tertile by 1.81% per month on a risk-adjusted basis (seven-factor alpha) following low sentiment periods. However, this negative EPU premium disappears following high sentiment periods.

Our univariate portfolio-level results are robust to stock-level Fama-MacBeth cross-sectional regressions that control for firm size, book-to-market, momentum, short-term reversal, lottery demand, idiosyncratic volatility, illiquidity, total volatility, investment, profitability, and price, one by one as well as controlling for all these variables simultaneously.

Our findings complement the recently reported U.S. and Chinese evidence of an unconditional EPU premium. We show that the EPU premium is stronger (weaker) following periods of low (high) investor sentiment to the extent that it can virtually disappear following periods of high sentiment. Our results indicate that investors may be willing to pay high prices for stocks with positive uncertainty beta and require extra compensation to hold stocks with the negative beta but only in low sentiment periods. These results are consistent with strong (weak) intertemporal hedging demand for positive EPU beta stocks in low (high) sentiment periods. It is also consistent with limited (full) participation of pessimistic investors and investors with a high aversion to uncertainty in low (high) sentiment periods. Finally, our results indicate that as a trading strategy, betting against uncertainty beta would be more effective during periods of low investor sentiment.

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Table 1. Descriptive Summary

This table reports the descriptive statistical summary for each variable, which includes stock EPU beta based on Australian EPU (β^{EPU}), and stock EPU beta based on global EPU (β^{GEPU}), current return (RET), log market capitalization (SIZE), book-to-market ratio (BM), momentum (MOM), stock return reversal (REV), highest daily return in the month (MAX), idiosyncratic volatility (IVOL), illiquidity (ILLIQ), total volatility (TV), investment factor (IA), return on equity (ROE), and log regular stock price (PRICE). The sample spans the time period from January 2009 to June 2018, which includes 76,497 observations. This table represents the average value, standard deviation, skewness, and the brief value distribution for each variable.

	β^{EPU}	β^{GEPU}	RET	SIZE (log)	BM	MOM	REV	MAX	IVOL	ILLIQ	ROE	TV	IA	PRICE (log)
Mean	0.4706	0.4722	0.0089	19.0902	0.8104	0.0014	0.0100	0.0766	0.0342	0.0021	-0.0692	0.0355	0.7709	0.2916
Std	2.2704	2.2143	0.1515	1.9685	0.6581	0.0456	0.1520	0.0665	0.0267	0.0018	0.3805	0.0267	0.1874	1.4818
Skew	0.4367	0.5191	0.4768	0.5054	1.8978	-0.1612	0.4839	2.2079	1.8886	1.7957	-1.6243	1.8672	-1.1992	0.6021
Min	-5.7689	-5.5116	-0.4228	15.3841	0.0621	-0.1278	-0.4232	0.0016	0.0040	0.0001	-1.5696	0.0044	0.1575	-1.9597
1%	-5.7689	-5.5116	-0.4228	15.3841	0.0621	-0.1278	-0.4232	0.0016	0.0040	0.0001	-1.5696	0.0044	0.1575	-1.9597
5%	-3.0467	-2.9174	-0.2327	16.2359	0.1230	-0.0819	-0.2305	0.0161	0.0079	0.0004	-0.8894	0.0090	0.3706	-1.7720
25%	-0.7505	-0.7096	-0.0648	17.6348	0.3571	-0.0221	-0.0645	0.0329	0.0156	0.0009	-0.1720	0.0169	0.6834	-0.9041
50%	0.2323	0.2240	0.0016	18.8556	0.6452	0.0046	0.0020	0.0561	0.0265	0.0016	0.0367	0.0278	0.8114	0.1218
75%	1.5666	1.5031	0.0728	20.3278	1.0638	0.0256	0.0741	0.0967	0.0442	0.0028	0.1384	0.0457	0.9179	1.2726
95%	4.5998	4.5816	0.2719	22.7899	2.0833	0.0754	0.2761	0.2095	0.0863	0.0057	0.3569	0.0873	0.9825	3.0378
99%	7.8424	7.7367	0.5546	24.4318	3.7037	0.1303	0.5566	0.3922	0.1510	0.0094	0.6835	0.1520	1.0000	4.5919
Max	7.8424	7.7367	0.5546	24.4318	3.7037	0.1303	0.5566	0.3922	0.1510	0.0094	0.6835	0.1520	1.0000	4.5919
N	76497	76497	76497	76497	76497	76497	76497	76497	76497	76497	76497	76497	76497	76497

Table 2. Pearson Correlation Matrix

This table reports pair-wise correlation among selected variables in the paper. The significance is defined as * p<.1, ** p<.05, ***p<.01.

	β^{EPU}	β^{GEPU}	SIZE	BM	MOM	REV	MAX	IVOL	ILLIQ	TV	IA	ROE	PRICE
β^{EPU}	1.0000												
β^{GEPU}	0.9348***	1.0000											
SIZE	-0.1018***	-0.1083***	1.0000										
BM	0.0861***	0.0754***	-0.2183***	1.0000									
MOM	-0.0499***	-0.0530***	0.1840***	-0.3485***	1.0000								
REV	-0.0219***	-0.0173***	0.0253***	-0.1069***	-0.0381***	1.0000							
MAX	0.1019***	0.1113***	-0.4911***	0.0662***	-0.2183***	-0.0060*	1.0000						
IVOL	0.1205***	0.1287***	-0.5875***	0.1085***	-0.2493***	0.0014	0.8921***	1.0000					
ILLIQ	0.1188***	0.1263***	-0.6322***	0.1267***	-0.2547***	-0.0126***	0.8164***	0.9318***	1.0000				
TV	0.1238***	0.1318***	-0.5675***	0.1036***	-0.2467***	0.0008	0.9004***	0.9878***	0.9392***	1.0000			
IA	0.0361***	0.0341***	-0.2072***	0.0807***	0.0012	0.0094***	0.1439***	0.1612***	0.1693***	0.1614***	1.0000		
ROE	-0.1142***	-0.1221***	0.4178***	0.0382***	0.1729***	0.0467***	-0.3889***	-0.4594***	-0.4629***	-0.4606***	-0.0831***	1.0000	
PRICE	-0.0975***	-0.1003***	0.6491***	-0.2158***	0.0995***	0.0158***	-0.3288***	-0.3895***	-0.4224***	-0.3745***	-0.1962***	0.2943***	1.0000

Table 3. Persistence of Australian EPU Beta

This table examines the persistence of Australian β^{EPU} by using the Fama-Macbeth two-stage regression model. The table reports the coefficients between the future 6-month and 12-month EPU beta (β^{EPU}) on its current EPU beta (β^{EPU}). Column 1 and column 3 report the results of univariate regressions. Column 2 and column 4 present the results of multivariate regressions which control several relative factors. Newey-West (1987) t-statistics are reported in parenthesis, where the significance is defined as * p<.1, ** p<.05, ***p<.01.

	(1) β^{EPU} 6-month	(2) β^{EPU} 6-month	(3) β^{EPU} 12-month	(4) β^{EPU} 12-month
β^{EPU}	0.6286***	0.5995***	0.4063***	0.3636***
	(34.19)	(33.97)	(21.56)	(19.45)
SIZE		-0.0039		-0.0011
		(-0.47)		(-0.10)
BM		-0.0172		0.0048
		(-0.73)		(0.24)
MOM		-1.9242**		-2.6534***
		(-2.26)		(-2.69)
REV		0.0670		0.1183
		(0.38)		(0.53)
MAX		-0.0903		0.1894
		(-0.17)		(0.28)
IVOL		0.1593		-6.0666*
		(0.06)		(-1.89)
ILLIQ		7.0844		33.6713
		(0.39)		(1.29)
TV		0.9919		7.7039*
		(0.33)		(1.93)
IA		0.0223		-0.0037
		(0.50)		(-0.06)
ROE		-0.2788***		-0.3704***
		(-6.20)		(-7.44)
PRICE		-0.0203**		-0.0214**
		(-2.26)		(-2.16)
Cons.	0.2101***	0.1264**	0.3045***	0.1053
	(6.91)	(2.49)	(8.88)	(1.59)
Obs.	76057	76057	71170	71170

Table 4. Characteristics of EPU-sorted Portfolios

This table presents the characteristics of portfolios sorted on Australian EPU beta (β^{EPU}). The stocks in our sample are grouped into three portfolios (Low β^{EPU}, Med β^{EPU}, and High β^{EPU}), and the portfolios are reformed every month. The characteristics are the average value of the three portfolios during the sample period. T-statistics are reported in parenthesis, where the significance is defined as * p<.1, ** p<.05, ***p<.01.

	SIZE	BM	MOM	REV	MAX	IVOL	ILLIQ	TV	IA	ROE	PRICE
Low β^{EPU}	19.4608***	0.7266***	0.0104***	0.0054	0.0678***	0.0304***	0.0018***	0.0315***	0.7621***	-0.0309***	0.4811***
	(427.33)	(81.14)	(9.31)	(1.25)	(59.88)	(65.48)	(50.55)	(59.81)	(401.05)	(-9.11)	(26.25)
Med β^{EPU}	19.8822***	0.7531***	0.0094***	0.0061*	0.0538***	0.0238***	0.0014***	0.0251***	0.7509***	0.0296***	0.7643***
	(589.23)	(94.30)	(10.62)	(1.73)	(60.06)	(66.42)	(52.63)	(58.92)	(410.25)	(10.52)	(47.94)
High β^{EPU}	18.7540***	0.8499***	0.0040***	0.0014	0.0864***	0.0392***	0.0024***	0.0404***	0.7796***	-0.1505***	-0.0616***
	(582.30)	(60.69)	(2.79)	(0.20)	(65.32)	(82.24)	(65.77)	(75.03)	(262.64)	(-42.88)	(-4.44)
High - Low	-0.7067***	0.1233***	-0.0064***	-0.0041	0.0185***	0.0088***	0.0006***	0.0089***	0.0175***	-0.1196***	-0.5427***
	(-18.26)	(11.84)	(-6.83)	(-0.65)	(13.65)	(18.05)	(17.75)	(18.67)	(6.51)	(-26.00)	(-19.13)

Table 5. Relation Between EPU beta and Selected Firm Characteristics

This table reports the coefficients of control variables on Australian EPU beta (β^{EPU}) by using Fama-Macbeth two-stage regression model. The dependent variable is Australian EPU beta (β^{EPU}). Regression (1) to (11) present the correlation coefficients of each single control variable with β^{EPU}, while regression (12) presents the comprehensive regression results of all the control variables on β^{EPU}. Newey-West (1987) t-statistics are reported in parenthesis, where the significance is defined as * p<.1, ** p<.05, ***p<.01.

	β^{EPU}											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SIZE	-0.1223***											0.0058
	(-11.55)											(0.57)
BM		0.2636***										0.2246***
		(8.66)										(6.94)
MOM			-2.5530***									0.6279
			(-3.26)									(0.67)
REV				-0.3859								-0.1656
				(-1.23)								(-0.55)
MAX					3.9829***							2.1028***
					(10.34)							(5.34)
IVOL						11.9686***						7.8714***
						(13.10)						(4.74)
ILLIQ							184.9491***					4.7781
							(12.68)					(0.23)
TV								12.3575***				18.4701***
								(13.61)				(4.04)
IA									0.4171***			0.1244*
									(5.83)			(1.67)
ROE										-0.7055***		-0.3702***
										(-15.53)		(-6.76)
PRICE											-0.1633***	-0.0578***
											(-11.66)	(-6.61)
Cons.	2.8222***	0.2359***	0.4474***	0.4273***	0.1782***	0.0833**	0.1105***	0.0561	0.1395***	0.4203***	0.5177***	-0.1302
	(13.39)	(6.26)	(15.00)	(12.92)	(4.79)	(2.08)	(2.79)	(1.38)	(2.91)	(13.88)	(17.48)	(-0.57)
Obs.	76497	76497	76497	76497	76497	76497	76497	76497	76497	76497	76497	76497

Table 6. Performance of Portfolios Sorted on Australian EPU beta

This table reports the performance of portfolios sorted on Australian EPU beta (β^{EPU}). The stocks in our sample are grouped into three portfolios (Low β^{EPU}, Med β^{EPU}, and High β^{EPU}), and the portfolios are reformed every month. The first column presents the average β^{EPU} for the Low-, Med-, and High- β^{EPU} portfolios. This table also presents the average excess returns (Ret – Rf), average alphas from the Fama-French (1993) 3-factor model (α3), the Carhart (1997) 4-factor model (α4), and the 7-factor model (α7). Panel A presents the performance of equal-weighted portfolios, and Panel B presents the performance of value-weighted portfolios. The last row presents the performance difference between the High β^{EPU} portfolios and Low β^{EPU} portfolios. T-statistics are reported in parenthesis, where the significance is defined as * p<.1, ** p<.05, ***p<.01.

		Panel A. Equal-weighted				Panel B. Value-weighted			
	β^{EPU}	Ret - Rf	α3	α4	α7	Ret - Rf	α3	α4	α7
Low	-1.6713***	-0.0401***	-0.0609***	-0.0628***	-0.0622***	-0.0392***	-0.0592***	-0.0610***	-0.0608***
	(-38.78)	(-9.04)	(-6.86)	(-6.40)	(-5.75)	(-9.05)	(-6.81)	(-6.35)	(-5.73)
Med	0.2552***	-0.0347***	-0.0553***	-0.0579***	-0.0583***	-0.0341***	-0.0540***	-0.0568***	-0.0574***
	(12.13)	(-9.11)	(-7.35)	(-6.97)	(-6.31)	(-9.13)	(-7.29)	(-6.94)	(-6.30)
High	2.8166***	-0.0458***	-0.0742***	-0.0760***	-0.0749***	-0.0451***	-0.0732***	-0.0568***	-0.0740***
	(72.33)	(-8.46)	(-6.91)	(-6.40)	(-5.76)	(-8.39)	(-6.85)	(-6.94)	(-5.72)
High - Low	4.4878***	-0.0057***	-0.0133***	-0.0132***	-0.0126**	-0.0059***	-0.0141***	-0.0140***	-0.0132**
	(65.17)	(-2.73)	(-3.12)	(-2.81)	(-2.44)	(-2.77)	(-3.24)	(-2.91)	(-2.49)

Table 7. Fama-Macbeth Two-stage Regression of Australian EPU beta on Expected Excess Returns

This table reports the estimated coefficients from Fama-Macbeth two-stage regressions of Australian EPU beta (β^{EPU}) on the expected stock excess return (Ret – Rf)$_{t+1}$. Column (1) presents the effect of β^{EPU} on the expected excess return. Column (2) to (13) present the effect of β^{EPU} on expected excess return while controlling relative factors. Newey-West (1987) t-statistics are reported in parenthesis, where the significance is defined as * p<.1, ** p<.05, ***p<.01.

	Expected Excess Return (Ret – Rf)$_{t+1}$												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
β^{EPU}	-0.0015***	-0.0010**	-0.0017***	-0.0013***	-0.0013**	-0.0014***	-0.0013***	-0.0013***	-0.0013***	-0.0014***	-0.0013***	-0.0012**	-0.0015***
	(-2.94)	(-2.23)	(-3.73)	(-2.66)	(-2.50)	(-2.87)	(-2.83)	(-2.73)	(-2.85)	(-2.89)	(-2.76)	(-2.59)	(-3.49)
SIZE		0.0041***											-0.0001
		(5.26)											(-0.12)
BM			0.0107***										0.0114***
			(6.42)										(8.95)
MOM				0.1267***									0.0915***
				(3.44)									(3.30)
REV					0.0329***								0.0266***
					(3.70)								(4.01)
MAX						-0.1983***							0.0042
						(-8.58)							(0.16)
IVOL							-0.5431***						-0.1505
							(-8.44)						(-0.70)
ILLIQ								-8.7539***					-4.4493***
								(-8.50)					(-3.03)
TV									-0.5561***				0.0507
									(-8.32)				(0.20)
IA										-0.0165***			-0.0095**
										(-2.70)			(-1.99)
ROE											0.0457***		0.0323***
											(11.28)		(10.92)
PRICE												0.0022**	-0.0005
												(2.40)	(-0.53)
Cons.	-0.0394***	-0.1172***	-0.0480***	-0.0406***	-0.0390***	-0.0405***	-0.0406***	-0.0409***	-0.0407***	-0.0266***	-0.0394***	-0.0403***	-0.0417***
	(-8.04)	(-6.44)	(-10.49)	(-8.65)	(-8.08)	(-8.36)	(-8.49)	(-8.59)	(-8.55)	(-5.78)	(-8.14)	(-7.99)	(-3.09)
Obs.	76450	76450	76450	76450	76450	76450	76450	76450	76450	76450	76450	76450	76450

Table 8. Performance of Portfolios Sorted on Global EPU beta

This table reports the performance of portfolios sorted on Global EPU beta (β^{GEPU}). The stocks in our sample are grouped into three portfolios (Low β^{GEPU}, Med β^{GEPU}, and High β^{GEPU}), and the portfolios are reformed every month. The first column presents the average β^{GEPU} for the Low-, Med-, and High- β^{GEPU} portfolios. This table also presents the average excess returns (Ret – Rf), average alphas from the Fama-French (1993) 3-factor model (α3), the Carhart (1997) 4-factor model (α4), and the 7-factor model (α7). Panel A presents the performance of equal-weighted portfolios, and Panel B presents the performance of value-weighted portfolios. The last row represent the performance difference between the High β^{GEPU} portfolios and Low β^{GEPU} portfolios. T-statistics are reported in parenthesis, where the significance is defined as * p<.1, ** p<.05, ***p<.01.

		Panel A. Equal-weighted				Panel B. Value-weighted			
	β^{GEPU}	Ret - Rf	α3	α4	α7	Ret - Rf	α3	α4	α7
Low	-1.5987***	-0.0401***	-0.0601***	-0.0613***	-0.0602***	-0.0392***	-0.0583***	-0.0597***	-0.0590***
	(-38.60)	(-9.12)	(-6.80)	(-6.27)	(-5.58)	(-9.13)	(-6.75)	(-6.24)	(-5.59)
Med	0.2420***	-0.0342***	-0.0539***	-0.0573***	-0.0576***	-0.0337***	-0.0528***	-0.0563***	-0.0566***
	(14.16)	(-8.93)	(-7.08)	(-6.84)	(-6.18)	(-8.96)	(-7.04)	(-6.81)	(-6.16)
High	2.7796***	-0.0462***	-0.0764***	-0.0780***	-0.0776***	-0.0455***	-0.0754***	-0.0770***	-0.0766***
	(87.01)	(-8.54)	(-7.16)	(-6.61)	(-6.02)	(-8.46)	(-7.10)	(-6.56)	(-5.96)
High - Low	4.3783***	-0.0061***	-0.0163***	-0.0167***	-0.0174***	-0.0063***	-0.0170***	-0.0173***	-0.0176***
	(70.94)	(-2.90)	(-3.87)	(-3.59)	(-3.40)	(-2.92)	(-3.97)	(-3.63)	(-3.36)

Table 9. Fama-Macbeth Two-stage Regression of Global EPU beta

This table reports the estimated coefficients from Fama-Macbeth two-stage regressions of Global EPU beta (β^{GEPU}) on the expected stock excess returns (Ret – Rf) $_{t+1}$. Column (1) presents the effects of β^{GEPU} on the expected excess return. Column (2) to (13) present the effects of β^{GEPU} on expected excess return while controlling relative factors. Newey-West (1987) t-statistics are reported in parenthesis, where the significance is defined as * p<.1, ** p<.05, ***p<.01.

	Expected Excess Return (Ret – Rf) $_{t+1}$												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
β^{GEPU}	-0.0015***	-0.0010**	-0.0017***	-0.0014***	-0.0012**	-0.0014***	-0.0014***	-0.0013***	-0.0014***	-0.0014***	-0.0014***	-0.0012***	-0.0016***
	(-3.10)	(-2.33)	(-3.88)	(-2.92)	(-2.45)	(-3.06)	(-3.01)	(-2.89)	(-3.02)	(-3.04)	(-3.00)	(-2.75)	(-3.75)
SIZE		0.0041***											-0.0000
		(5.27)											(-0.08)
BM			0.0107***										0.0115***
			(6.38)										(8.99)
MOM				0.1296***									0.0937***
				(3.50)									(3.39)
REV					0.0320***								0.0263***
					(3.55)								(3.93)
MAX						-0.1973***							0.0085
						(-8.51)							(0.32)
IVOL							-0.5416***						-0.1565
							(-8.38)						(-0.73)
ILLIQ								-8.7362***					-4.3714***
								(-8.44)					(-2.98)
TV									-0.5545***				0.0465
									(-8.26)				(0.18)
IA										-0.0165***			-0.0096**
										(-2.71)			(-2.00)
ROE											0.0457***		0.0322***
											(11.33)		(10.93)
PRICE												0.0022**	-0.0005
												(2.42)	(-0.56)
Cons.	-0.0394***	-0.1173***	-0.0480***	-0.0405***	-0.0389***	-0.0404***	-0.0406***	-0.0409***	-0.0407***	-0.0265***	-0.0394***	-0.0402***	-0.0421***
	(-8.06)	(-6.46)	(-10.52)	(-8.65)	(-8.10)	(-8.38)	(-8.51)	(-8.61)	(-8.57)	(-5.77)	(-8.16)	(-8.01)	(-3.10)
Obs.	76450	76450	76450	76450	76450	76450	76450	76450	76450	76450	76450	76450	76450

Table 10. Performance of Portfolios Sorted on Sentiment and Australian EPU beta

This table reports the performance of bivariate sorted portfolios on Australian Sentiment and Australian EPU beta (β^{EPU}). Firstly, the stocks are sorted into two groups based on the sentiment proxy (CCI). Secondly, within each group, the stocks are sorted into three portfolios. The portfolios are reformed every month. The first column presents the average β^{EPU} for the Low-, Med-, and High- β^{EPU} portfolios. This table also presents the average excess returns (Ret – Rf), average alphas from the Fama-French (1993) 3-factor model (α3), the Carhart (1997) 4-factor model (α4), and the 7-factor model (α7). Panel A presents the performance of portfolios in Low CCI months, and Panel B presents the performance of portfolios in High CCI months. The last row presents the performance difference between the High β^{EPU} portfolios and Low β^{EPU} portfolios. T-statistics are reported in parenthesis, where the significance is defined as * p<.1, ** p<.05, ***p<.01.

Panel A. Low CCI		Equal-weighted				Value-weighted			
	β^{EPU}	Ret - Rf	α3	α4	α7	Ret - Rf	α3	α4	α7
Low	-1.6863***	-0.0321***	-0.0503***	-0.0569***	-0.0539***	-0.0313***	-0.0487***	-0.0554***	-0.0528***
	(-30.39)	(-5.81)	(-4.47)	(-4.42)	(-3.83)	(-5.78)	(-4.42)	(-4.39)	(-3.82)
Med	0.1757***	-0.0289***	-0.0476***	-0.0548***	-0.0525***	-0.0285***	-0.0465***	-0.0539***	-0.0518***
	(9.62)	(-6.14)	(-5.03)	(-5.09)	(-4.40)	(-6.14)	(-4.98)	(-5.07)	(-4.39)
High	2.7599***	-0.0403***	-0.0689***	-0.0760***	-0.0720***	-0.0396***	-0.0678***	-0.0750***	-0.0710***
	(58.12)	(-5.79)	(-4.91)	(-4.73)	(-4.09)	(-5.71)	(-4.85)	(-4.68)	(-4.04)
High - Low	4.4462***	-0.0082***	-0.0186***	-0.0192***	-0.0181**	-0.0083***	-0.0191***	-0.0196***	-0.0182**
	(49.36)	(-2.99)	(-3.36)	(-3.00)	(-2.54)	(-2.97)	(-3.36)	(-2.99)	(-2.50)

Panel B. High CCI		Equal-weighted				Value-weighted			
	β^{EPU}	Ret - Rf	α3	α4	α7	Ret - Rf	α3	α4	α7
Low	-1.6445***	-0.0542***	-0.0822***	-0.0776***	-0.0793***	-0.0533***	-0.0800***	-0.0756***	-0.0773***
	(-23.99)	(-7.78)	(-6.08)	(-5.34)	(-4.74)	(-7.90)	(-6.11)	(-5.36)	(-4.75)
Med	0.3966***	-0.0450***	-0.0707***	-0.0672***	-0.0735***	-0.0443***	-0.0691***	-0.0659***	-0.0720***
	(9.83)	(-7.24)	(-5.94)	(-5.23)	(-5.03)	(-7.28)	(-5.91)	(-5.22)	(-5.00)
High	2.9174***	-0.0555***	-0.0846***	-0.0789***	-0.0824***	-0.0549***	-0.0839***	-0.0782***	-0.0818***
	(44.57)	(-6.60)	(-5.11)	(-4.43)	(-4.08)	(-6.59)	(-5.11)	(-4.43)	(-4.08)
High - Low	4.5619***	-0.0013	-0.0024	-0.0013	-0.0031	-0.0016	-0.0039	-0.0027	-0.0045
	(43.45)	(-0.41)	(-0.37)	(-0.18)	(-0.39)	(-0.52)	(-0.58)	(-0.37)	(-0.54)

Table 11. Fama-Macbeth Two-stage Regression of Australian EPU beta on Expected Excess Returns During Low and High Sentiment Periods

This table reports the estimated coefficients from Fama-Macbeth two-stage regressions of Australian EPU beta (β^{EPU}) on expected stock excess return $(Ret - Rf)_{t+1}$ in different sentiment periods. Panel A presents the estimated coefficients between the Australian EPU beta (β^{EPU}) and control variables on expected excess return during the Low-Sentiment months, and Panel B presents the correlation coefficients between the Australian EPU beta (β^{EPU}) and control variables on expected excess return during High-Sentiment months. The column (1) presents the effects of β^{EPU} on the expected excess return. Column (2) to (13) present the effects of β^{EPU} on expected excess return while controlling relative factors. Newey-West (1987) t-statistics are reported in parenthesis, where the significance is defined as * p<.1, ** p<.05, ***p<.01.

Panel A. Low Sentiment Period

	Expected Excess Return $(Ret - Rf)_{t+1}$												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
β^{EPU}	-0.0020***	-0.0019***	-0.0023***	-0.0020***	-0.0017***	-0.0019***	-0.0018***	-0.0018***	-0.0019***	-0.0020***	-0.0019***	-0.0017***	-0.0021***
	(-3.20)	(-3.08)	(-3.97)	(-3.14)	(-2.67)	(-3.02)	(-3.02)	(-2.93)	(-3.03)	(-3.11)	(-3.01)	(-3.01)	(-3.71)
SIZE		0.0038***											0.0000
		(4.18)											(0.05)
BM			0.0100***										0.0100***
			(4.53)										(6.12)
MOM				0.0988**									0.0707*
				(2.03)									(1.95)
REV					0.0289**								0.0197**
					(2.35)								(2.19)
MAX						-0.1951***							-0.0127
						(-6.75)							(-0.36)
IVOL							-0.5203***						-0.2747
							(-6.43)						(-1.03)
ILLIQ								-8.3985***					-4.7753**
								(-6.62)					(-2.44)
TV									-0.5328***				0.2556
									(-6.29)				(0.74)
IA										-0.0165**			-0.0110*
										(-2.10)			(-1.71)
ROE											0.0453***		0.0339***
											(8.71)		(8.32)
PRICE												0.0023**	-0.0008
												(2.14)	(-0.61)
Cons.	-0.0327***	-0.0328***	-0.0409***	-0.0337***	-0.0312***	-0.0336***	-0.0339***	-0.0342***	-0.0340***	-0.0198***	-0.0326***	-0.0336***	-0.0331***
	(-5.69)	(-5.86)	(-7.47)	(-6.21)	(-5.64)	(-5.96)	(-6.06)	(-6.14)	(-6.12)	(-3.57)	(-5.75)	(-5.68)	(-5.70)
Obs.	45563	45563	45563	45563	45563	45563	45563	45563	45563	45563	45563	45563	45563

Panel B. High Sentiment Period													
	Expected Excess Return (Ret – Rf) $_{t+1}$												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
β^{EPU}	-0.0004	-0.0004	-0.0007	-0.0000	-0.0004	-0.0004	-0.0004	-0.0003	-0.0004	-0.0004	-0.0004	-0.0001	-0.0005
	(-0.55)	(-0.52)	(-0.93)	(-0.01)	(-0.54)	(-0.60)	(-0.51)	(-0.45)	(-0.53)	(-0.55)	(-0.51)	(-0.20)	(-0.84)
SIZE		0.0045***											-0.0003
		(3.16)											(-0.24)
BM			0.0119***										0.0140***
			(5.43)										(7.20)
MOM				0.1764***									0.1287***
				(3.47)									(3.08)
REV					0.0399***								0.0389***
					(3.68)								(4.66)
MAX						-0.2042***							0.0344
						(-5.31)							(0.86)
IVOL							-0.5835***						0.0707
							(-5.43)						(0.19)
ILLIQ								-9.3867***					-3.8687*
								(-5.17)					(-1.75)
TV									-0.5976***				-0.3142
									(-5.43)				(-0.80)
IA										-0.0165			-0.0069
										(-1.64)			(-0.98)
ROE											0.0463***		0.0293***
											(7.00)		(7.06)
PRICE												0.0020	0.0001
												(1.24)	(0.05)
Cons.	-0.0514***	-0.0518***	-0.0607***	-0.0527***	-0.0528***	-0.0526***	-0.0525***	-0.0528***	-0.0526***	-0.0386***	-0.0516***	-0.0522***	-0.0608***
	(-6.36)	(-6.61)	(-8.10)	(-6.75)	(-6.62)	(-6.50)	(-6.61)	(-6.69)	(-6.65)	(-5.62)	(-6.50)	(-6.26)	(-7.98)
Obs.	30887	30887	30887	30887	30887	30887	30887	30887	30887	30887	30887	30887	30887

Table 12. Interaction Fama-Macbeth Two-stage Regression with Sentiment Dummy

This table reports the results of the Fama-Macbeth two-stage regression with Sentiment dummy variables. We use a dummy variable, which the dummy equals 1 if a month is in a low (high) sentiment period, otherwise is 0. We create an interaction term between the EPU beta (β^{EPU}) and the dummy variable to examine the conditional effect of the EPU beta (β^{EPU}) on excess stock returns. Newey-West (1987) t-statistics are reported in parenthesis, where the significance is defined as * p<.1, ** p<.05, ***p<.01.

	Expected Excess Return (Ret – Rf) $_{t+1}$			
	(1)	(2)	(3)	(4)
β^{EPU}	-0.0015***	-0.0006**	-0.0015***	-0.0013***
	(-3.58)	(-2.26)	(-3.58)	(-3.28)
Low CCI Dummy	-0.0213***	-0.0206***		
	(-5.17)	(-4.82)		
β^{EPU} × Low CCI Dummy		-0.0009***		
		(-2.83)		
High CCI Dummy			-0.0200***	-0.0211***
			(-4.49)	(-4.58)
β^{EPU} × High CCI Dummy				-0.0002
				(-1.19)
SIZE	-0.0001	-0.0001	-0.0001	-0.0001
	(-0.12)	(-0.12)	(-0.12)	(-0.12)
BM	0.0114***	0.0114***	0.0114***	0.0114***
	(8.95)	(8.95)	(8.95)	(8.95)
MOM	0.0915***	0.0915***	0.0915***	0.0915***
	(3.30)	(3.30)	(3.30)	(3.30)
REV	0.0266***	0.0266***	0.0266***	0.0266***
	(4.01)	(4.01)	(4.01)	(4.01)
MAX	0.0042	0.0042	0.0042	0.0042
	(0.16)	(0.16)	(0.16)	(0.16)
IVOL	-0.1505	-0.1505	-0.1505	-0.1505
	(-0.70)	(-0.70)	(-0.70)	(-0.70)
ILLIQ	-4.4493***	-4.4493***	-4.4493***	-4.4493***
	(-3.03)	(-3.03)	(-3.03)	(-3.03)
TV	0.0507	0.0507	0.0507	0.0507
	(0.20)	(0.20)	(0.20)	(0.20)
IA	-0.0095**	-0.0095**	-0.0095**	-0.0095**
	(-1.99)	(-1.99)	(-1.99)	(-1.99)
ROE	0.0323***	0.0323***	0.0323***	0.0323***
	(10.92)	(10.92)	(10.92)	(10.92)
PRICE	-0.0027***	-0.0027***	-0.0027***	-0.0027***
	(-4.10)	(-4.10)	(-4.10)	(-4.10)
Cons.	-0.0212***	-0.0219***	-0.0224***	-0.0213***
	(-4.45)	(-4.74)	(-5.25)	(-5.02)
Obs.	76450	76450	76450	76450

Table 13. Fama-Macbeth Regressions with Alternative Definitions of Sentiment Periods

This table reports the estimated coefficients of Fama-Macbeth two stage regressions of expected stock excess returns $(Ret - Rf)_{t+1}$ on Australia EPU beta (β^{EPU}) and several control variables under different sentiment periods. We separate the sample period into three groups based on either the Australian Consumer Confidence Index (CCI) or the Australian EPU.. The months with low CCI are denoted as Low Sentiment months, the months with medium CCI are denoted as Med Sentiment months, and the months with high CCI are denoted as High Sentiment months. Similarly we also have Low EPU months, Med EPU months and High EPU months, corresponding with High sentiment months, Medium sentiment months and Low sentiment months, respectively. Panel A reports the EPU beta (β^{EPU}) effects on different CCI levels, and Panel B reports the EPU beta (β^{EPU}) effects on different EPU levels. Newey-West (1987) t-statistics are reported in parenthesis, where the significance is defined as * p<.1, ** p<.05, ***p<.01.

	Expected Excess Return $(Ret - Rf)_{t+1}$					
	Panel A. CCI			Panel B. EPU		
	Low	Med	High	Low	Med	High
β^{EPU}	-0.0017**	-0.0016**	-0.0010	-0.0008	-0.0019***	-0.0013**
	(-2.20)	(-2.59)	(-1.21)	(-1.16)	(-3.07)	(-2.02)
SIZE	-0.0002	0.0004	-0.0006	0.0007	-0.0007	0.0002
	(-0.21)	(0.45)	(-0.38)	(0.56)	(-0.65)	(0.25)
BM	0.0080***	0.0129***	0.0147***	0.0088**	0.0094***	0.0140***
	(4.27)	(6.41)	(5.36)	(2.27)	(4.09)	(8.71)
MOM	0.0782*	0.0544	0.1770***	0.1111	0.0916**	0.0860**
	(1.76)	(1.24)	(3.53)	(1.31)	(2.20)	(2.13)
REV	0.0229*	0.0180*	0.0474***	0.0097	0.0230**	0.0346***
	(1.86)	(1.90)	(4.28)	(0.77)	(2.16)	(3.37)
MAX	0.0099	-0.0122	0.0226	-0.0096	0.0741*	-0.0524
	(0.21)	(-0.30)	(0.50)	(-0.12)	(1.91)	(-1.34)
IVOL	-0.2687	0.0215	-0.2414	-0.9809	-0.2868	0.2029
	(-0.73)	(0.06)	(-0.80)	(-1.20)	(-0.98)	(0.69)
ILLIQ	-4.0828	-6.5160***	-1.5719	-22.4342***	1.0752	-4.1540**
	(-1.48)	(-2.81)	(-0.71)	(-7.68)	(0.41)	(-2.32)
TV	0.1867	0.0076	-0.1067	1.9756**	-0.3201	-0.1723
	(0.39)	(0.02)	(-0.35)	(2.23)	(-0.79)	(-0.51)
IA	-0.0116	-0.0132**	0.0003	0.0003	-0.0075	-0.0141*
	(-1.30)	(-2.03)	(0.03)	(0.03)	(-1.20)	(-1.74)
ROE	0.0392***	0.0304***	0.0237***	0.0342***	0.0321***	0.0319***
	(7.86)	(6.88)	(4.38)	(4.54)	(7.03)	(6.87)
PRICE	-0.0025**	-0.0032***	-0.0021	-0.0040*	-0.0009	-0.0039***
	(-2.30)	(-3.02)	(-1.54)	(-2.02)	(-0.84)	(-4.73)
Cons.	-0.0356***	-0.0354***	-0.0658***	-0.0434***	-0.0444***	-0.0405***
	(-5.05)	(-4.46)	(-6.99)	(-4.02)	(-6.17)	(-4.96)
Obs.	27730	28251	20469	9133	30453	36864

Figure 1. Australia EPU and Global EPU

This figure presents both Australian and Global EPU indices over the period from January 2009 to June 2018. The X axis represents months, and the Y axis represents the value of the indices.

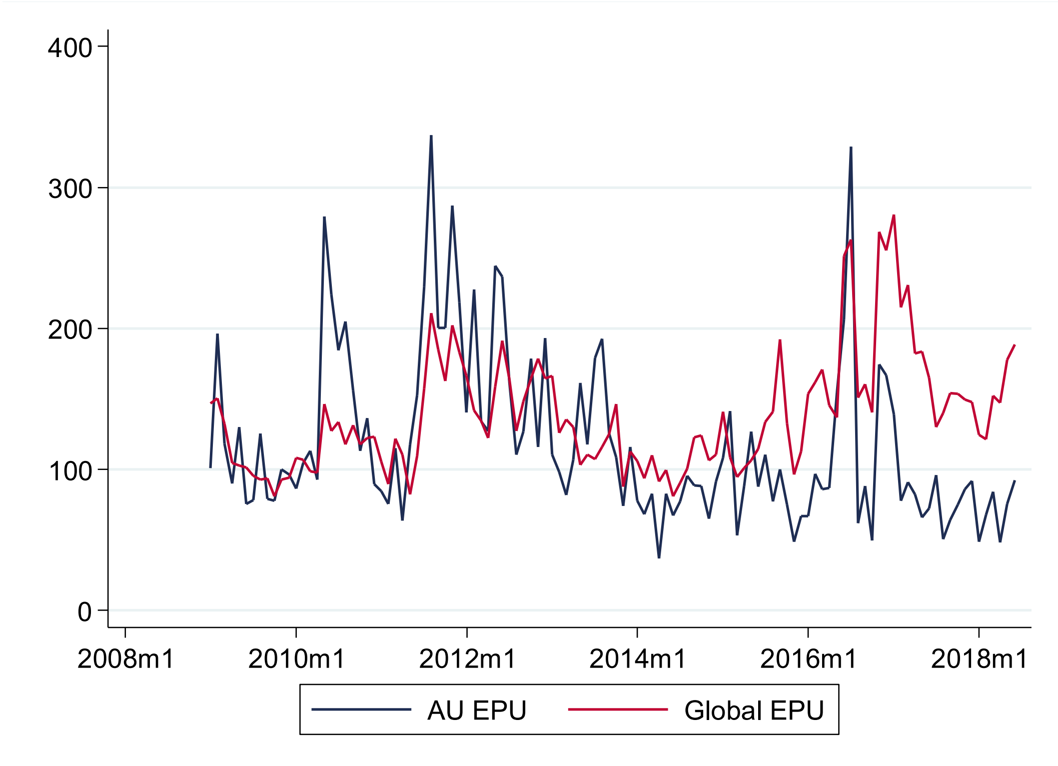
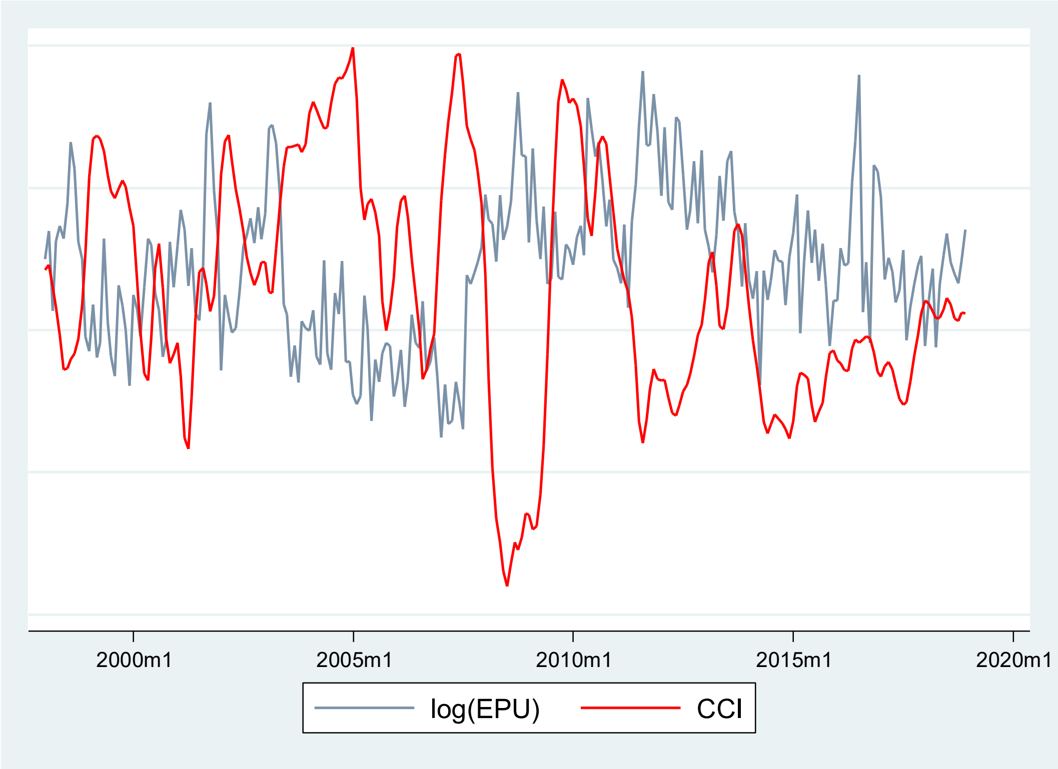


Figure 2. Australian EPU and Australian CCI

This figure presents the co-movement between Australian EPU index and Australian CCI index over the period from January 2009 to June 2018. The significance is defined as * p<.1, ** p<.05, ***p<.01.



Correlation	log (EPU)	CCI
log (EPU)	1.00	
CCI	-0.46***	1.00

Appendix 1. Definition of Variables

Variable	Definition	Author
SIZE	Log of the firm's market capitalization at the end of month *t*	Fama & French (1992)
BM	The firm's book-to-market ratio six months prior	Fama & French (1992)
MOM	The average cumulative return of a stock over a period of 11 months ending one month prior to the portfolio formation month	Jegadeesh & Titman (1993)
REV	The return on the stock in month $t-1$	Jegadeesh (1990) and Lehmann (1990)
IVOL	The standard deviation of the daily residuals in a month from Fama French 3-factor regression (1992): $R_{i,d} = \alpha_i+\beta_i^{MKT}MKT_d+\beta_i^{SMB}SMB_d+\beta_i^{HML}HML_d+\varepsilon_{i,d}$ where $R_{i,d}$ is the excess daily returns; MKT_d is the daily market excess returns; SMB_d is the daily size factor; HML_d is the daily book-to-market factor	Ang et al. (2009)
TV	The standard deviation of the daily stock returns in month *t*	Blitz & Vliet (2007)
MAX	The stock's highest daily return in month $t\text{-}1$	Bali et al. (2011)
ILLIQ	Following the equation: Illiquidity rate = $\frac{1}{Day_{i,m}}\sum_{t=1}^{Day_{i,m}}\frac{\lvert Ret_{i,t}\rvert}{Vol_{i,t}}$ where $Day_{i,m}$ is the number of days for stock *i* in month *m*; $Ret_{i,t}$ is to the return of stock *i* on day *t* in month *m*; $Vol_{i,t}$ is the trading volume in dollar term of stock *i* on day *t* in month m	Amihud (2002)
CP	Monthly closing price	Brandt et al. (2010)
I/A	The annual growth rate of total assets	Hou et al. (2015)
ROE	Return on equity, calculated as earnings per share including extraordinary items divided by the average of last year's and current year's common equity	Hou et al. (2015)

Appendix 2. Summary Statistics for 7 factors

This table reports the descriptive statistical summary for the 7 factors that was applied by Bali et al. (2107), which includes the Market Premium Factor (MRP), the Size Factor (SMB), the Value Factor (HML), the Momentum Factor (UMD), the Liquidity Factor (LIQ), the Investment Factor ($R_{I/A}$), and Profitability Factor (R_{ROE}). The sample period spans 114 months from January 2009 to June 2018. This table represents the average value, standard deviation, skewness, and the brief value distribution for each factor.

	MRP	SMB	HML	UMD	LIQ	$R_{I/A}$	R_{ROE}
Mean	0.0051	-0.0031	0.0420	0.0116	-0.0007	-0.0054	-0.0380
Std	0.0354	0.0448	0.0261	0.0415	0.0173	0.0306	0.0459
Skew	-0.4044	0.0068	0.5398	-0.3958	-0.1996	-0.1618	-0.0825
Min	-0.0834	-0.1351	-0.0192	-0.1300	-0.0612	-0.0895	-0.1712
1%	-0.0826	-0.0955	-0.0126	-0.1097	-0.0537	-0.0874	-0.1395
5%	-0.0586	-0.0774	0.0028	-0.0668	-0.0263	-0.0598	-0.1093
25%	-0.0192	-0.0348	0.0230	-0.0118	-0.0118	-0.0212	-0.0688
50%	0.0083	-0.0056	0.0434	0.0142	-0.0007	-0.0047	-0.0397
75%	0.0322	0.0277	0.0538	0.0364	0.0076	0.0112	-0.0030
95%	0.0590	0.0689	0.0967	0.0667	0.0308	0.0502	0.0406
99%	0.0663	0.0907	0.1217	0.1236	0.0409	0.0617	0.0571
Max	0.0732	0.1152	0.1242	0.1365	0.0493	0.0713	0.0586
N	114	114	114	114	114	114	114