The Asset Pricing Implications of
Government Economic Policy Uncertainty*

Jonathan Brogaard

Andrew Detzel

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Abstract: Using a search-based measure to capture economic policy uncertainty for 21 countries, we find that when economic policy uncertainty increases by 1%, contemporaneous market returns fall by 2.9% and market volatility increases by 18%. An economic policy uncertainty factor-mimicking portfolio earns positive abnormal returns of 70 basis points per month and market-wide equity risk premiums increase for at least two years. Aggregate cash flows, especially private investment experience a level shift downward but return to normal growth rates after one quarter. Our results suggest that indecisiveness in government economic policymaking has material and long-lasting real and financial implications.

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Contact: Jonathan Brogaard, Foster School of Business, University of Washington, (Email) brogaard@uw.edu, (Tel) 206-685-7822; Andrew Detzel, Foster School of Business, University of Washington, (Email) adetzel@uw.edu, (Tel) 206-543-0721.

I. Introduction

Mathematics professor John Allen Paulos famously quipped, "Uncertainty is the only certainty there is."[1] Uncertainty about the future has real implications on economic agents' behavior (Bernanke, 1983; Bloom, 2009; Bloom, Bond, and Van Reenen, 2007; Dixit, 1989). Government policymakers can add another layer of uncertainty regarding fiscal, regulatory, or monetary policy, which we refer to as *economic policy uncertainty*. Government economic policy is important; in 2009 federal, state and local government expenditures in the United States totaled $5.9 trillion, 42.45% of the gross domestic product.[2] The ubiquity of government policy makes it very hard to diversify against. Thus, uncertainty related specifically to the economic policy of governments may impact financial markets.[3] In this paper we test the asset pricing implications of economic policy uncertainty.

To motivate what we mean by economic policy uncertainty, consider the political events surrounding the U.S. debt ceiling debate during the summer of 2011. After months of debate, congress passed a bill increasing the debt ceiling. However, after the bill passed on August 2, 2011, economic policy uncertainty had not been resolved. As part of the debt ceiling agreement, the Joint Select Committee on Deficit Reduction was created to agree upon $1.5 trillion in budget cuts over the next ten years by November 23, 2011. Economic policy uncertainty came from both the uncertainty about whether an agreement would be made regarding the debt ceiling, *and* the fact that many policy decisions were left unresolved in the bill that finally passed.

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[1] A Mathematician Plays the Stock Market, by John Allen Paulos, Basic Books, 2003.

[2] This is true even after deducting transfers from the federal to state governments. http://www.gpo.gov and http://www.census.gov.

[3] Knight (1921) established a distinction between risk and uncertainty. Risk refers to the possibility of a future outcome for which the probabilities of the different possible states of the world are known. Uncertainty refers to a future outcome that has unknown probabilities associated with the different possible states of the world. When referring to economic policy uncertainty we mean uncertainty or risk as we do not take a stand on whether the probabilities of the future direction policymakers will take can be ascertained with any degree of certainty.

The above example is one instance of economic policy uncertainty. Such occurrences frequently arise (e.g. tax changes, health care reform, and social security reform, to name a few that have been discussed recently in the United States).[4] Governments have large direct and indirect influences on the environment in which the private sector operates (McGrattan, Ellen, and Prescott, 2005). The debt ceiling debate exemplifies two important factors of the importance of economic policy uncertainty: the passage of a law or rule alone does not mean the uncertainty is resolved, and the values in question are of large economic significance.

In this paper we test the impact of economic policy uncertainty on asset prices. We create an index similar to that of Baker, Bloom and Davis (2012) using the Access World News database.[5] We measure country-specific news for 21 countries at a monthly frequency to obtain a large time-series and cross-sectional database of country economic policy uncertainty. In the debt-ceiling example, our measure allows us to observe in an objective fashion the amount of uncertainty leading up to, and following, the legislation's passage. We show that economic policy uncertainty increases the equity risk premium and decreases cash flows. The cash flow impact lasts one quarter into the future, while the risk premium is heightened for over two years.

The appeal of our measure is that it allows for a continuous tracking of policy risk compared with the alternatives. Traditionally, empiricists have taken two approaches to measuring the impact of policy on asset prices. Under the first approach, researchers conduct event studies with respect to the date of the policy implementation.[6] Although event studies have the advantage of being well-documented with a timeline of events leading up to the culmination of the event of interest, they can be artificially precise. As the example of the debt

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[4] There is interesting literature on policy reform including Brender and Drazen (2008), Drazen and Easterly (2001), and Fernandez and Rodrik (1991),

[5] Measures based on news have become a useful way to observe certain behavior at a higher frequency than was allowed previously (e.g. Da, Engelberg, and Gao, 2010).

[6] Some such papers include Ait-Sahalia, Andritzky, Jobst, Nowak, and Tamirisa (2010), Cutler (1988), Rigobon and Sack (2004), Sialm (2009), Thorbecke (1997), and Ulrich (2011).

ceiling debate makes clear, the passing of a bill does not necessarily indicate the resolution of all uncertainty.

Under the second approach, studies use elections as a resolution of government uncertainty (Belo, Gala, and Li, 2012; Boutchkova, Hitesh, Durnev, and Molchanov, 2012; Durnev, 2010; Li and Born, 2006; Pantzalis, Stangeland, and Turtle, 2000; Santa-Clara and Valkanov, 2003). Compared to a political election measure of economic policy uncertainty resolution, the search news measure we employ has several advantages. First, news-based economic policy uncertainty measures are available on an ongoing basis. Elections occur infrequently and so only capture short intervals of uncertainty resolution. At the same time, as relevant economic policy decisions change over time, it is problematic to use an election in the current period as a measure of uncertainty resolution for forthcoming policy issues.

Second, news-based measures *quantify* uncertainty resolution rather than assume a new regime resolves uncertainty. Although politicians provide statements about how they want to set economic policy, there is no strong mechanism binding them to their statements. In addition, economic policy is set in a dynamic political setting where compromises must be made, legal and judicial hurdles must be incorporated, and many times more nuanced rule making occurs by the appropriate administrative agency. For example, although President Obama signed into law the Dodd-Frank Wall Street Reform and Consumer Protection Act on July 21, 2010, the U.S Commodity Futures Trading Commission continues to write and clarify rules relating to the bill. With a high-frequency sentiment measure, one can carry out precise empirical tests that isolate the longer-term impact of economic policy uncertainty related to specific decisions.

To capture country-specific economic policy uncertainty, we search the database of Access World News, one of the largest news source aggregators. For each month between 1990 and 2012 we search for key terms such as “tax” and “regulation” jointly with words that convey uncertainty such as “unsure” and “unclear.” Access World News returns all articles in its database containing these key words. We capture the number of articles it returns and use the frequency of articles about economic policy uncertainty to quantify the level of such uncertainty in the economy. Because we are interested in cross-country variation, we also require the search mentions the country's name in order for the article to count towards a given country's economic policy uncertainty. There are more articles in more recent years, partly due to the growth of news outlets, but more importantly due to the digitalization of virtually all modern-news sources, and so we normalize the frequency of country-related economic policy uncertainty by the total number of articles about that country in the selected month.

Our measure is a variation of the Baker, Bloom and Davis (2012) measure. We use a similar keyword search as the Baker et al. (2012) paper. However, we extend it to an international setting and utilize the extensive Access World News database. In addition, we expand the possible keywords used to capture economic policy uncertainty. Finally, our measure is a reduced form of the Baker et al. (2012) measure in that we focus solely on the news component due to data availability issues of the other two components of their measure (expiring tax regulations and forecaster variability) in the international setting.

We relate our economic policy uncertainty measure to market returns. Through a variety of specifications in a simple OLS regression setting, we find a negative contemporaneous correlation between changes in economic policy uncertainty and market returns, and a positive relationship between current levels of economic policy uncertainty and future market returns. Positive shocks to economic policy uncertainty coincide with a decline in prices, but higher future returns. This is consistent with economic policy uncertainty having real asset pricing implications, and leads one to think about the mechanism by which economic policy uncertainty drives asset-pricing dynamics.

Next we tease out why increases in economic policy uncertainty result in lower contemporaneous returns and why higher levels of economic policy uncertainty result in higher future returns. From basic financial theory, a decrease in prices can be due to negative changes in expected cash flows, or an increase in discount rates. Theoretical work shows that uncertainty can impact future cash flows (Aizenman and Marion, 1993; Born and Pfeifer, 2011; Hermes, and Lensink, 2001). Empirical work to date suggests there is an effect (Erb, Harvey, and Viskanta, 1996; Hassett and Metcalf, 1999; Julio and Yook, 2012). The asset pricing effect of economic policy uncertainty has not been thoroughly studied empirically, but there is a strong theoretical foundation to it (Croce, Kung, Nguyen, and Schmid, 2011; Croce, Nguyen, and Schmid, 2011; Gomes, Kotlikoff, and Viceira, 2011; Pastor and Veronesi, 2011 and 2012).

We find evidence that the effect comes from both changes to expected cash flows and discount rates. When economic policy uncertainty increases, cash flows decrease, as seen through a drop in gross domestic product (GDP). We consider which components of GDP economic policy uncertainty affects by analyzing separately the three largest components: investment, consumption, and government expenditure. We find that economic policy uncertainty has a sizeable impact on private investment.

In addition, economic policy uncertainty commands a risk-premium in the cross-section of U.S. stock returns. We sort U.S. stocks in the CRSP universe each month into equal-weighted quintiles based on their estimate exposure to economic policy uncertainty. We find that the portfolio that is long (short) in the quintile with the greatest (least) exposure to economic policy uncertainty earns significant positive abnormal returns with respect to the standard Fama French Three factor model and the Five factor model, augmented with the Carhart (1997) momentum factor and the Pastor and Stambaugh (2003) liquidity factor.

Having shown that economic policy uncertainty impacts the discount rate as well as cash flows, we extend the analysis to determine how long the impact lasts. If agents simply wait for the policy uncertainty to be resolved before investing, we would see economic policy uncertainty only temporarily impacting asset prices (McDonald and Siegel, 1986). Alternatively, economic policy uncertainty may cause enduring changes in agents' value-maximizing behavior.

To test the two different hypotheses, we repeat the analysis conducted earlier but incorporate a lead-lag relationship between returns, cash flows, and economic policy uncertainty. If the effect is temporary, we expect to see reversion in the coefficients – an initial underperformance will subsequently be followed by over-performance. If the effect is permanent, it could be so in two ways. First, it could be that the economic policy uncertainty shifts asset prices down in a one-time event. We would see this in the results by cash flows being below average for a few quarters and thereafter returning to normal. It would show up in the discount rate by the cumulative expected returns increasing initially, but thereafter leveling out. Alternatively, the effect could be permanent in that it could continue to decrease cash flows and demand a higher discount rate beyond its initial impact. If this is the case, cash flows will continue to underperform into the future and cumulative expected returns will remain elevated.

We test the alternative effects for up to two years into the future (eight quarters for the GDP data and 24 months for the stock returns), and we find cash flows are permanently shifted lower. Growth rates decrease for one quarter after an increase in economic policy uncertainty and thereafter resume their normal growth rate. That is, the effect causes a permanent shift downward; we do not observe above-average growth following the one quarter with below-average results.

To examine the longevity of the risk premium implications, we follow Santa-Clara and Valkanov (2003) and decompose returns into their expected and unexpected components. We find that expected returns (risk premium) are permanently higher with an ongoing effect for at least two years following an increase in economic policy uncertainty. The risk premium is greater initially, and continues to be greater for the entire period of the analysis – the cumulative expected returns are increasing with economic policy uncertainty even after two years. These results hold after controlling for business cycle considerations. We find that a lack of policy certainty has economically important and long-lasting implications for asset prices.

The paper is organized as follows. In Section II, we describe our data and the construction of variables. Section III presents the results of our main specifications relating economic policy uncertainty to stock returns. Section IV decomposes the effect on cash flows and discount rates. Section V explores the longevity of asset pricing implications, and Section VI concludes.

II. Data and variable construction

The data in this paper come from a variety of sources. We use the Datastream Total Return Index as a measure of stock market performance in a given country. The total return index represents the growth of a representative sample of stocks which cover over 75% of a country's total market capitalization, include dividends (and assumes they are reinvested), and is value weighted by market capitalization. We also capture a country's index dividend yield from Datastream.

Quarterly Real GDP, private investment, private consumption, and government consumption expenditure data come from IMF International Financial Statistics via Datastream. We use the real GDP series I99B. As a proxy for private investment, we use the real gross fixed capital formation series I93E. For real private consumption we use series I96F, and for government expenditure we use series I91F. These variables are seasonally adjusted. The inflation reference years differ from country to country, but our analyses always use first differences of the logarithms of these variables, so the normalization is irrelevant.

We create a variety of business cycle variables from the International Monetary Fund (IMF) series via Datastream that are used to capture the business cycle. *BILL* is the IMF short-term treasury rate for each country if available (Datastream item I60C). For South Korea no such treasury rate is available, and the Australian treasury bill series is discontinuous, so following Hjalmarsson (2010), we use the central bank discount rate for these countries (Datastream item I60). The IMF also has a long-term treasury series for countries (Datastream item I61). *TSP* is the difference between this IMF long-term treasury yield and the country's *BILL*. Insufficient business cycle variable data were available for Brazil, China, Hong Kong, India, the Netherlands and Russia, so they are excluded from analyses using the business cycle variables.

Our objective is to build a measure that captures the degree of economic policy uncertainty. We use an approach similar to Baker, Bloom and Davis (2012). They use three distinct components to capture economic policy uncertainty: newspaper coverage, federal tax code provisions set to expire, and disagreement between economic forecasters. Due to limited availability of the tax code and economic forecaster disagreement for many countries, we focus exclusively on a search-based newspaper coverage measure of economic policy uncertainty. We use Access World News, a vast database of archived news stories from around the globe, to create our measure. Access World News contains over 191 million articles from over 6,300 local, regional, national, and international papers and news sources from around the globe. The database covers from 1980 to today, with more recent years covering more media sources. We perform all searches in English, as Access World News translates articles written in foreign languages into English.

Each month, for a given country, we collect the frequency of articles describing a country's economic policy uncertainty and create the variable *Economic Policy Uncertainty* (*EPU*). For an article to be an EPU article we require three criteria. First, an article must mention the country of interest. For instance, when creating the index for Australia we require that the word "Australia," or one of its derivations, such as "Australia's" or "Australian," be mentioned in the article. Second, to capture uncertainty, the article must contain at least one of the following terms or its derivation: ambiguous, indecision, indefinite, indeterminate, questionable, speculative, uncertain, unclear, unconfirmed, undecided, undetermined, unresolved, unsure, vague, or variable. Finally, the article must discuss economic policy. In particular, one of the following key terms must be used in an article to count as an article related to economic policy uncertainty: budget, central bank, deficit, federal reserve, policy, regulation, spend or tax. For each word, we also allow its various deviations, such as "regulate" or "regulatory" to satisfy the policy discussion requirement.[7]

We mine the Access World News database for key terms in the text of the archives. We restrict the possible news sources to magazines or newspapers. The level of news, and news digitized, varies over time. To control for the increased volume of articles, we scale the raw economic policy uncertainty article count by the number of articles that mention the country of interest and contain the word "today." We perform this search every month from January 1990 to March 2012. From this search we capture the total number of news articles in a given month t for a specific country j. This value is used as a measure of how much overall news is being produced and captured by Access World News. We scale the economic policy uncertainty measure by the news intensity measure to create *EPU*. The final variable is multiplied by 100 and logged:

$$EPU_{j,t} = \text{Ln}\left(100 * \frac{\text{Number of Economic Policy Uncertainty Articles}_{j,t}}{\text{Total Number of Articles}_{j,t}}\right). \quad (1)$$

In Table 1 we report summary statistics of the newly created measure. We use data from 21 countries: Australia, Brazil, China, Canada, England, France, Germany, Great Britain, Hong Kong, India, Italy, Japan, Mexico, Malaysia, Netherlands, Russia, South Africa, South Korea, Spain, Sweden, Switzerland and the United States. The 21 countries were chosen based on having a stock market with a market capitalization of more than $500 billion at the beginning of

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[7] Our measure closely imitates Baker, Bloom and Davis (2012); see their paper for an in depth analysis of a similar search-based measure in the United States.

2011. Table 1 Column 2 reports the time period for which we have sufficient data to create *EPU*. For most countries we have data from January 1990 through March 2012; however, Brazil, China, and Russia have abbreviated time series (starting in 1994, 1993, and 1998, respectively).

Column 3 shows the average value of *EPU* for each country. It ranges between 2.333 (India) and 3.257 (Hong Kong). The standard deviation of *EPU* is reported in Column 4 and ranges between 0.0057 (UK) and 0.0243 (Brazil). Besides the level of *EPU*, we are interested in the change in *EPU, ΔEPU*. The level provides information about the degree of economic policy uncertainty for country *j* in month *t*. The change offers evidence on the innovation in economic policy uncertainty. Both are of interest: a shock to economic policy uncertainty is new information for which there may be a price reaction; the level, on the other hand, is fully known (after accounting for the new innovation), but may still have implications for cash flows and discount rates. We report the one-period (one-month) change in *EPU* in Columns 7 and 8.

INSERT TABLE 1 ABOUT HERE

One concern with studying economic policy uncertainty is that we are simply capturing general uncertainty. To test this hypothesis we capture general economic concern by calculating the standard deviation of a country's total return index daily returns. Arnold and Vrugt (2008), Bansal and Yaron (2004), Bittlingmayer (1998), and Veronesi (1999) show that economic uncertainty causes asset price volatility. Thus, we create a variable, *Uncertainty*, for each country-month, which is the standard deviation of daily returns for country *j*, in month *t*, given by the daily Datastream Total Return Index, and multiplied by 100. Column 5 reports each country's mean, and Column 6 its standard deviation; while Columns 9 and 10 do the same for its first difference. The correlation between *Uncertainty* and *EPU* is only 0.1836 (and 0.0527 between their first differences), so we are capturing an effect distinct from that of general uncertainty.

Restricting momentarily to the United States, we consider the logarithm of the U.S. VIX index, a measure of economic uncertainty, and our *EPU* index. Figure 1 plots the time series of the U.S. VIX index and our *EPU* index. Beber and Brandt (2009) and Ederington and Lee (1996) suggest that measures of implied volatility on major market indices, such as VIX, capture economic uncertainty because financial markets reflect macroeconomic fundamentals. The correlation between the U.S. VIX and *EPU* is 0.1957. When VIX goes up, *EPU* generally does as well. However, a large proportion of the VIX measure of general uncertainty moves independently of *EPU*.[8]

INSERT FIGURE 1 ABOUT HERE

Table 2 shows the country-pairwise correlations between *EPU*. For most countries the correlations are relatively low, with the median correlation 0.39. An extant literature shows there is significant international correlation of economic variables (Ambler, Cardia, and Zimmermann, 2004; Baxter and Crucini, 1993; Canova, 1998; Roll, 1988) and therefore some joint movement is not unexpected, but there is wide variation with the variability, often consistent with intuition. For instance, Germany and France have a correlation coefficient of 0.71, whereas the Netherlands and Australia have a -0.03 correlation coefficient. We exploit this variation in the rest of the paper to produce a panel dataset to study the implications of economic policy uncertainty on asset prices.

INSERT TABLE 2 ABOUT HERE

[8] We reproduce Figure 1 with the Baker, Bloom, and Davis (2012) economic policy uncertainty index as well. The graph is qualitatively similar but the correlation is higher (0.5578) between the Baker et al. index and the VIX.

III. Economic Policy Uncertainty and Stock Returns

In this section we establish that economic policy uncertainty affects contemporaneous and future stock market returns. Furthermore, we document that increases in policy uncertainty result in an increase in asset price volatility.

a. Stock Returns

Figure 2 plots the U.S. economic policy uncertainty index with the U.S. monthly return time series.

INSERT FIGURE 2 ABOUT HERE

The correlation between the two is -0.102. We formally measure this relationship in the international setting.[9]

To measure the link between stock returns and economic policy uncertainty we estimate a variety of panel regressions of the form:

$$r_{j,t} = \alpha + \beta' I_{j,t} + \gamma' FE + \varepsilon_{j,t} \tag{2}$$

where j denotes the country and t the month. The returns $r_{j,t}$ are one-month holding period returns measured by the Datastream total market return index for country j during month t. For clarity of timing, note that EPU_{t-1} is the level of EPU during the month $t-1$, calculated using news between the beginning of month $t-1$ and the end of month $t-1$. Forward-looking expectations of

[9] We reproduce Figure 2 with the Baker, Bloom, and Davis (2012) index. It is qualitatively similar although their index has a considerably lower, but still positive, correlation of 0.0435 with the US Total Return Index.

month t are based on EPU_{t-1}. The vector $I_{j,t}$ used in different specifications of Equation 2 includes different combinations of levels and first differences of the natural logarithms of Uncertainty and Economic Policy Uncertainty indices, $Uncertainty_t$ and EPU_t, respectively. Under the null hypothesis where economic policy uncertainty has no effect on prices, the beta on ΔEPU_t and EPU_{t-1} should equal zero in the regression. Each regression includes country-fixed effects ($\gamma' FE$) to prevent unobserved heterogeneity across countries from biasing the coefficients. Table 3 reports the results. The t-statistics are reported in parentheses below the coefficients, and standard errors are double-clustered by country and month. Clustering standard errors by month allows for arbitrary cross-sectional correlation, which is a possibility given the potential regional and/or global nature of economic shocks. Clustering by country allows for heteroskedasticity across countries.

INSERT TABLE 3 ABOUT HERE

Column 1 shows that in a simple univariate regression the contemporaneous relationship between ΔEPU_t and stock returns is significantly negative, with an increase in economic policy uncertainty associated with a significant drop in prices. Similar results hold for the measure of general uncertainty described in Section II, $\Delta Uncertainty_t$ (Column 2). General uncertainty also tends to increase while contemporaneous stock prices decline. Intuitively, a negative shock to the macro economy, including one to economic policy uncertainty would tend to increase volatility and decrease stock prices. When including both ΔEPU_t and $\Delta Uncertainty_t$ in Column 3, both are statistically significant.

The results in Column 3 suggest that general uncertainty and economic policy uncertainty can be distinguished from each other. Also, the increase in the Adjusted R-squared between Columns 1 and 2 (0.004 and 0.042, respectively), and Column 3 (0.046) suggests that the two types of uncertainty explain different aspects of stock returns.

Column 4 focuses on the level effect of *EPU*. The regression specification includes both the contemporaneous level, EPU_t, as well as the one-month lagged level, EPU_{t-1}. This is necessary considering the level of EPU_t is problematic: Column 1 shows that an increase in EPU_t results in a negative return. At the same time, though, we hypothesize that persistent high economic policy uncertainty will produce a higher risk premium, and thus higher returns. The two effects could be offsetting. To isolate the different effects we include the one-period lag and the contemporaneous level of *EPU*. EPU_t has a negative coefficient (-3.061) while EPU_{t-1} has a positive one (2.810) and both are statistically significant. The coefficient signs are consistent with the hypothesis that there is a risk premium associated with economic policy uncertainty, and innovations in *EPU* affect stock prices. Column 5 does the same analysis on the general uncertainty level variable. The results are similar – a positive coefficient on the lagged variable, and a negative coefficient on the contemporaneous one. The sign and statistical significance is robust to combining the two types of uncertainty (Column 6).

b. Volatility

To test the hypothesis that higher economic policy uncertainty results in lower immediate returns and higher future returns via an increase in risk, we examine whether volatility increases with economic policy uncertainty. Such a difference in riskiness would arise from differences in economic policies being less clear in their economic impact or having more hurdles to overcome before becoming definitive. If there were a difference in the riskiness of the stock market following economic policy uncertainty, it could possibly command a positive risk premium to compensate investors for the greater risks incurred in those periods. We investigate this hypothesis by measuring the volatility of returns contemporaneous and following changes in the level of economic policy uncertainty.

If increases in the *EPU* index are, ceteris paribus, associated with increases in a country's macroeconomic risk, then market return volatility should be higher the month following an increase in the *EPU*. To test whether an increase in *EPU* is associated with an increase in volatility, we first run a regression of the change in monthly volatility, $\Delta Volatility$, calculated as the first difference of the logged standard deviation of the within-month daily returns of month t for country j on the change in economic policy uncertainty in month t for country j:

$$\Delta Volatility_{j,t} = \alpha + \beta_1 \Delta EPU_{j,t} + \beta_2 \Delta EPU_{j,t-1} + \mu' X_{j,t} + \gamma' FE + \varepsilon_{j,t} \quad (3)$$

wherein the first specification $X_{jt} = \emptyset$, and in the remaining specifications, X_{jt} contains control variables described below. If β_1 is positive, then increases in the ΔEPU are associated with increases in monthly return volatilities, $\Delta Volatility_{j,t}$. If β_2 is also positive it suggests the effect persists. If β_1 and β_2 lose their significance with the inclusion of X_{jt}, then this relationship is due only to ΔEPU acting as a proxy for business-cycle effects. Each regression includes country-fixed effects ($\gamma' FE$). Table 4 reports the results. The t-statistics are reported in parentheses below the coefficients and are computed using standard errors double-clustered by country and month.

INSERT TABLE 4 ABOUT HERE

Column 1 shows the contemporaneous relationship, while Column 2 shows the one-month lagged relationship. Interestingly, the lagged change in EPU has a larger impact than the contemporaneous impact. The results from the univariate contemporaneous regression analysis show that contemporaneous volatility increases by 7.67% when economic policy uncertainty increases by 1%, but is not statistically significant. However, the one-period ahead volatility increases by 18.8%, statistically significant at the 1% level. Still not controlling for other variables, but now conditioning on both the contemporaneous and lagged ΔEPU, the excess volatility increases by a statistically significant 18.2% and 26.3% with a 1% increase in contemporaneous and lagged ΔEPU, respectively.

One explanation for the contemporaneous and one-month ahead correlation between economic policy uncertainty and excess returns is based on a "proxy" effect. Changes in the economic policy uncertainty might merely be proxying for variations in expected returns due to business cycle fluctuations. Since variations in returns have been associated with business cycle fluctuations (Campbell, 1991; Fama, 1991; and Campbell, Lo, and MacKinlay, 1997) and business cycle fluctuations have been associated with political variables (Faust and Irons, 1999; Gonzalez, 2000; Alesina and Rosenthal, 1995; Alesina, Roubini, and Cohen, 1997; and Drazen, 2000), one could hypothesize that the relationship between returns and a politically motivated variable simply captures the reflection of the correlation between the business cycle and political variables. If economic policy uncertainty were proxying for such business cycle factors, then the observed relationship between economic policy uncertainty and returns would be unsurprising. Hence, this relationship could disappear once we account for those factors.

To test the alternative hypothesis we include three variables that have been shown to be associated with the business cycle and to forecast stock market returns: the log of dividend yield DP_t, the difference between the short-term and long-term interest rate TSP_t, and the short-term treasury rate $Bill_t$ (Ang and Bekaert, 2007; Hjalmarsson, 2010). If the economic policy variable contains only information about returns that can be explained by business cycle fluctuations, then the coefficient of ΔEPU should equal zero. To avoid problems with seasonality of dividends, we consider the 12-month moving average of dividend-yield although all results are robust to non-seasonally adjusted dividend yields.

Columns 4 and 5 repeat the exercise performed in Columns 2 and 3, except they include first differences of business cycle control variables. In the lagged-only analysis (Column 4), the coefficient of ΔEPU_{t-1} remains statistically significant at 0.188. Conditioning on contemporaneous and lagged values of *ΔEPU* (Column 5) also yields statistically significant slopes that are qualitatively identical to their values without the controls (0.187 and 0.265 versus 0.182 and 0.263).

Overall, the volatility results indicate that macroeconomic risk, as measured by stock market volatility, increases contemporaneously with, and following increases in, *ΔEPU*, even controlling for other business cycle effects. This is consistent with a discount-rate explanation of the return results in which a positive shock to economic policy uncertainty increases risk and therefore expected excess returns. This manifests empirically in an immediate drop in prices followed by higher average returns in the following months seen in Table 3.

IV. Decomposing the Effect on Cash Flows and Discount Rates

Section III shows that economic policy uncertainty has implications for asset returns. Here, we begin to analyze the mechanism by which economic policy uncertainty influences asset prices. We take as given the fact that contemporaneous stock returns decline and volatility increases with increases in *ΔEPU*, while sustained higher levels of *EPU* are associated with higher returns in the future. We now decompose the effect into a numerator (cash flow) or denominator (discount rate) effect. Since positive shocks to *ΔEPU* are associated with decreases in stock prices, and future returns are higher following periods of heighted *EPU*, economic policy uncertainty must be associated with a cash-flow effect or a discount rate effect.

a. Cash Flows

If economic policy uncertainty has a cash-flow effect, then changes in GDP should be negatively associated with changes in the *EPU* index. We consider aggregate GDP data as well as its components, private investment as measured by gross fixed capital formation, private consumption, and government expenditures. We exclude China in the cash flow analysis due to lack of data. The data are available on a quarterly basis. As such, we calculate a quarterly ΔEPU by taking the net sum of change in *EPU* over the corresponding three-month interval, for example, $\Delta EPU_{1990Q1} = EPU_{1990Mar} - EPU_{1990Jan}$. We run the following four regressions for overall GDP and its four components:

$$\begin{aligned}\Delta GDP_{j,t} &= \alpha_j + \beta \Delta GDP_{j,t-1} + \gamma \Delta EPU_{j,t-1} + \eta_{j,t} \\ \Delta INV_{j,t} &= \alpha_j + \beta \Delta INV_{j,t-1} + \gamma \Delta EPU_{j,t-1} + \eta_{j,t} \\ \Delta CONS_{j,t} &= \alpha_j + \beta \Delta CONS_{j,t-1} + \gamma \Delta EPU_{j,t-1} + \eta_{j,t} \\ \Delta GOV_{j,t} &= \alpha_j + \beta \Delta GOV_{j,t-1} + \gamma \Delta EPU_{j,t-1} + \eta_{j,t}\end{aligned} \tag{4}$$

where ΔINV is the first difference of the natural logarithm of private investment, $\Delta CONS$ is the first difference of the natural logarithm of private consumption, and ΔGOV is the first difference of the natural logarithm of government expenditure. We include the one-period lagged change in *EPU*. The regressions include fixed effects and standard errors that are double clustered by quarter and country. The contemporaneous change seen in Table 4 shows there is a relationship with stock returns and volatility, and may be the same with cash flows. The variable of interest is the one period lagged change in *EPU*. We focus on this measure as we want to avoid confounding effects that may arise due to the simultaneous determination of the cash flow measure and ΔEPU.

INSERT TABLE 5 ABOUT HERE

We run each specification separately. Table 5 Column 1 examines overall GDP. The lagged ΔEPU is statistically significant at the 1% level, with a negative coefficient of -0.0672.

A more precise measure of the effects of economic policy uncertainty can be obtained by looking at the three components of GDP. Thus, we may find that when there is economic policy uncertainty only certain categories of GDP are affected. In fact, it could be that the composition of GDP changes. If we find that increases in lagged *ΔEPU* decreases investment and increases consumption, that would also have meaningful implications for the effect of economic policy uncertainty on economic performance.

Columns 2 – 4 consider the regression specification for each of the GDP components, investment, consumption, and government expenditure, respectively. For investment and consumption, lagged *ΔEPU* has a negative coefficient that is statistically significant at the 1% level. When *ΔEPU* increases by 1% in period *t*, U.S. private investment in period *t+1* decreases by 0.125% on average. Consumption is also affected, with a coefficient of -0.033. While government expenditures have a negative coefficient of -0.048, it is not statistically significant. These results reject the null hypothesis that economic policy uncertainty has no effect on cash flows. Indeed, at least part of the effect observed in the poor performance of asset prices following increases in economic policy uncertainty is due to effects on the decline in private investment.[10]

b. Discount Rates

Recent theoretical work suggests that economic policy uncertainty may demand a risk-premium and be observable in the cross section of stock returns. Pastor and Veronesi (2012) model firms with differing exposure to policy uncertainty. They posit that firms with higher exposure to policy uncertainty typically have higher expected returns, although the phenomenon is state-dependent and can potentially have the opposite effect.

To investigate the average cross-sectional effect of exposure to economic policy uncertainty on expected returns, we focus exclusively on the cross-section of U.S. returns and

[10] As an extra robustness check, we consider the first difference of the log market index as an additional right-hand-side variable in the GDP, Investment and Consumption regressions as markets are forward looking and incorporate all public information. The results from the Investment and GDP regressions are robust to its inclusions although the market change subsumes the significance in the Consumption regressions.

the U.S. *EPU* series. The data sample contains all U.S. CRSP stock returns between 1990 and 2011, the CRSP value-weighted market return, and the monthly U.S. Fama-French Three factors and Momentum from Kenneth French's website as well as the tradable Pastor Stambaugh Liquidity factor from CRSP. We estimate ranking EPU betas, for each permno-month (*i,m*), over the previous 60 months via the following regression:

$$r_{i,t} - r_{f,t} = \alpha + \beta_i^{MKT}(r_{m,t} - r_{f,t}) + \beta_i^{HML} HML_t + \beta_i^{SMB} SMB_t + \beta_i^{EPU} LogEPU_t + \epsilon_{i,t}, \quad (5)$$

$$t = m - 60, \dots, m - 1.$$

where r_{it} and r_{ft} are the returns on stock i and the three-month U.S. treasury bill for month t, respectively.

We sort each stock into five equal-weighted β^{EPU} portfolios for the ranking month. These are the test assets. Note that when *EPU* increases, prices generally fall so that a more negative *EPU* Beta indicates greater exposure to economic policy uncertainty. Stocks with the highest economic policy uncertainty exposure will have the most negative *EPU* betas. Then, for each portfolio $p = 1, \dots, 5$, we estimate the Fama French Three-Factor Model over the entire sample period (starting in 1995, 60 months after sample begins):

$$r_{p,t} - r_{f,t} = \alpha + \beta_p^{MKT}(r_{m,t} - r_{f,t}) + \beta_p^{HML} HML_t + \beta_p^{SMB} SMB_t + \epsilon_{p,t}. \quad (6)$$

We repeat the analysis for the five factor model that also includes the Carhart (1997) Momentum Factor (UMD), and the Pastor Stambaugh Liquidity Factor (LIQ), over the entire sample period:

$$r_{p,t} - r_{f,t} = \alpha + \beta_p^{MKT}(r_{m,t} - r_{f,t}) + \beta_p^{HML} HML_t + \beta_p^{SMB} SMB_t + \beta_p^{UMD} UMD_t + \beta_p^{LIQ} LIQ_t + \epsilon_{p,t}. \quad (7)$$

We also construct a factor-mimicking portfolio (1-5) return by subtracting the first quintile portfolio (most negative β^{EPU} stocks) return from the fifth (least negative β^{EPU} stocks) quintile portfolio return and repeat the previous analysis. This generates a zero-investment portfolio that is long in the first quintile portfolio and short in the fifth quintile portfolio.

Panel A presents average excess returns for each of the five portfolios sorted on β^{EPU} and the factor mimicking portfolio. Panel B presents the intercepts (abnormal returns or alpha) and slopes of these five portfolios from the Fama French Three-Factor model. Panel C presents the intercepts and slopes of these five portfolio returns using the Fama French Three-Factor model augmented with the Carhart Momentum Factor and the Pastor Stambaugh Liquidity Factor. Panel A reveals significant average returns that monotonically decrease from portfolio 1 (Column 1) to portfolio 5 (Column 5) consistent with earning positive returns for exposure to *EPU* risk. On average, the high exposure quintile portfolio earns 63 basis points per month more than the low quintile portfolio (Column 6).

Likewise, even controlling for the standard common risk factors, Panels B and C reveal significant positive abnormal returns on the most *EPU*-risky portfolios and a monotonic decline from the most *EPU*-risky portfolios to the least risky ones. In Panel B we see that the factor-mimicking portfolio earns significant average abnormal returns of 59 basis points per month with respect to the Fama French Three-Factor model. Including momentum and liquidity slightly increases the estimated risk-adjusted returns of the factor-mimicking portfolio to a monthly average of 70 basis points per month. We conclude that investors demand a risk premium for holding stocks with a greater exposure to economic policy uncertainty captured by our *EPU* measure. Figure 3 depicts the time series of the monthly returns obtained from investing in the economic policy uncertainty factor-mimicking portfolio.

INSERT FIGURE 3 ABOUT HERE

V. Temporary or Permanent Effect

To understand the significance of the impact economic policy uncertainty has on asset prices we analyze the longevity of the effects found in Sections III and IV.

a. Cash Flows

We again examine GDP as a national measure of cash flows, and also focus on its components as in Table 5. Table 5 shows investment is particularly sensitive to economic policy uncertainty, and consumption is moderately impacted. At the same time, government expenditure is unaffected. In the following analysis we are interested in how long a shock to economic policy uncertainty impacts GDP and private investment. To do so we rely on autoregressive distributed lag models.

Autoregressive distributed lag models (ARDL's*)* are time-series regressions of the form

$$y_t = \alpha + \beta_1 y_{t-1} + \cdots + \beta_p y_{t-p} + \gamma_0' \boldsymbol{x}_t + \gamma_1' \boldsymbol{x}_{t-1} + \cdots + \gamma_q' \boldsymbol{x}_{t-q} + \epsilon_t. \quad (8)$$

Financial economists use ARDLs to identify relationships between a time-series y_t and another time-series x_t that may depend on current and lagged values of each (e.g. Dailamia and Hauswald, 2007; Dickson and Starleaf, 1974; Evans and Lyons, 2008; and Schwert, 1989). Current and lagged variables' effects can be important in financial and macroeconomic time-series because economic decisions are made, and expectations are formed, using current and past information. For example, financial market participants will consider both current and prior changes in risk when determining their demand for risky assets. Then, macroeconomic variables such as GDP may be relatively slow to fully react to contemporaneous events such as increased economic policy uncertainty. A quarterly change in GDP could reflect contemporaneous economic or policy events, as well as those in prior quarters. In general, persistent effects not reflected in expectations also necessitate the inclusion of current and lagged values of an explanatory variable.

To distinguish how long a change in *EPU* impacts cash flows, we extend the simple one-lag model to one with two full years (eight quarters) of lagged *ΔEPU*. The regression specification is:

$$\Delta GDP_{j,t} = \alpha + \beta \Delta GDP_{j,t-1} + \sum_{i=1}^{8} \gamma_i \Delta EPU_{j,t-i} + \varepsilon_{j,t}. \tag{9}$$

All variables are as defined in previous tables. The results are in Table 7, Column 1.

INSERT TABLE 7 ABOUT HERE

Column 1 is the regression results of the specification in Equation 9. The t-statistics are reported in parentheses below the coefficients, and standard errors are double-clustered by country and month. The results show that, while the first lag of *ΔEPU* is still statistically significant, the remaining coefficients are not (except for t-5). A shock to *ΔEPU* has an economically meaningful impact on GDP for up to one quarter, but thereafter dissipates. Thereafter, GDP resumes its normal growth path. It is also worth noting that there is no subsequent statistically significant reversal in the signs of the coefficients over the next few quarters, suggesting that the suppressed growth is not recovered by future above-average growth. The fact that the coefficient no longer remains statistically significant after the first quarter, and the longer-lagged variable coefficients diminish rapidly thereafter, suggests that GDP growth experiences a level shift downward and resumes its normal level.

As Table 5, Column 2 shows, of the main components of GDP, EPU affects investment the most. Thus, we repeat the above analysis for private investment:

$$\Delta INV_{j,t} = \alpha + \beta \Delta INV_{j,t-1} + \sum_{i=1}^{8} \gamma_i \Delta EPU_{j,t-i} + \varepsilon_{j,t}. \quad (10)$$

ΔEPU is significantly and negatively associated with changes in private investment again in the initial quarter, but thereafter is no longer statistically significant. The results are in Table 7 Column 2. Like overall GDP, a shock to *ΔEPU* has an economically meaningful impact on private investment growth for no more than one quarter. Also like the GDP results, the coefficient does not reverse, suggesting a shift downward in investment as a result of the economic policy uncertainty.

We repeat the analysis for private consumption, replacing ΔINV in Equation 10 with $\Delta Cons$. The first lag just misses statistical significance at the 10% level (t=-1.65), but has a negative coefficient. When performing the ADL analysis on $\Delta Government$ no discernible effect is found. This is not surprising given the well-known persistence of consumption expenditures.

Tables 7 suggests that an increase in the U.S. *EPU* is associated with a meaningful, though temporary, reduction in aggregate cash flows as measured by GDP. This reduction comes primarily through a reduction in private investment. This is consistent with prior literature (e.g. Julio and Yook, 2012) that shows firms reduce their investment as elections near, as well as the theory of Pastor and Veronesi (2012) that suggests that "…firms should often cut their investment in response to policy uncertainty."

b. Returns

We ask a similar question on the longevity of the economic policy uncertainty impact on returns. Unlike with the cash flow analysis, we need not include the prior lag variables as we continue to look at the effect further out in time as market returns should rapidly (relative to real production and investment) assimilate and respond to information contained in publicly known information, such as innovations in economic policy uncertainty. The regression specification is:

$$r_{j,t,t+u} = \alpha_j + \beta_1 \Delta EPU_{j,t} + \beta_2 EPU_{j,t-1} + \gamma' X_{j,t} + \epsilon_{j,t} \tag{11}$$

where $r_{jt,t+u}$ is the market index holding period return of country j from month t to month $t+u$, for the values $u = 0, \dots, 23$. It is possible that the relationship between returns and the economic policy uncertainty index comes from the index acting as a proxy for the phase of the business cycle, or some other macro environment aspect not accounted for by dividend yield. We include as control variables (X_{jt}) four business cycle variables: the log of dividend yield, DP_t, the term spread TSP_t, the short-term treasury rate $BILL_t$, the one-month lagged stock return volatility, VOL_{t-1}, and the U.S. default spread, $SPREAD_t$. We use Newey-West standard errors to account for the serial correlation generated by using overlapping return windows, as well as heteroskedasticity across countries. We also cluster standard errors at the month level.

INSERT TABLE 8 ABOUT HERE

If the economic policy uncertainty index is just a proxy for other macro risk, then these macro economy control variables should load significantly, and β_1 and β_2 should equal 0. Column 1 represents the coefficient for ΔEPU_t, that is, the cumulative return associated with the change in EPU. Column 2 is the standard error. Column 3 is the effect of the level of EPU on future returns. Column 4 is its standard error. Finally, Column 5 is the Adjusted R-squared of the regression in Equation 11. Each row extends the future horizon an additional month. Row 1 is the one-month return, Row 2 is the two-month holding period return, and this is repeated until the 24-month cumulative return analysis is performed.

Column 1 shows that a 1% increase in *ΔEPU* is associated with a 2.685% decrease in the contemporaneous month return, but as the holding period extends to two months (Row 2), the effect becomes statistically insignificant.[11] Thereafter, the coefficient remains statistically insignificant for the rest of the test period (24 months). The decaying of the coefficient from negative and statistically significant to statistically insignificant is consistent with the risk premium analysis from Table 3: initially the shock accompanies a drop in prices, however the higher *EPU* leads to higher risk-compensating expected returns going forward. The second variable of interest in Table 8 is the level of *EPU*. For the level of *EPU*, the effect on future returns is ambiguous. The coefficient is statistically insignificant, for all time intervals.

Theoretical work suggests that economic policy uncertainty should not only affect cash flows, but may also impact discount rates. This would show up in the time-series of the risk premia (in addition to the cross section, as seen in Section IV.b.) Pastor and Veronesi (2011) provide a theoretical model in which economic policy uncertainty commands a risk premium. In particular, their model predicts that the market will demand higher expected returns for bearing the uncertainty about which policies policymakers will choose, what impact they will have, and which political interests will win, precisely what our *EPU* measure aims to capture. *EPU* increases when political factions compete. This uncertainty resolves only after a period of political maneuvering, and the final policy choice is highly unpredictable ex ante. Furthermore, the precise effects of various competing choices are largely unpredictable, as well as whether they will survive legal objections brought through the judicial system.

In Section IV.b we showed there was a cross sectional effect associated with economic policy uncertainty. To examine how long the risk-premia lasts after a shock to economic policy

[11] We also form impulse response functions based on bivariate vector autoregressive models of excess returns and first difference log(EPU) with lag length chosen via the Bayesian Information Criterion, for each country. These show that shocks to EPU are assimilated into the country's returns index within a quarter.

uncertainty, we focus on the time series risk premium commanded by economic policy uncertainty. Unlike in Section IV.b we are able to carry out the analysis using the full international dataset.

While the aggregate returns may not contain a lasting memory of EPU, the shock and risk premia components may be offsetting each other. We proceed to investigate whether this difference in realized returns can be attributed to an impact on the hypothesized time-series risk premium charged by investors for economic policy uncertainty, or to unexpected returns. A difference in expected returns would be consistent with economic policy uncertainty having an impact on the risk premium. If the difference is due to unexpected returns being affected by changes in economic policy uncertainty that would signal that the market is systematically surprised by the lack of clarity in forthcoming economic policy.

To distinguish between the two hypotheses we rerun the analysis separating the changes in expected and unexpected returns associated with changes in *EPU*. We decompose the monthly returns for each country's market index into expected and unexpected returns. The expected returns are given by taking the fitted values from the regression of returns on the lagged values of the predictability variables used in Equation 3: DP_t, TSP_t, $Bill_t$, VOL_{t-1}, and $SPREAD_t$. The unexpected returns are simply the residuals from this first regression. We include both the lagged level as well as the contemporaneous change in economic policy uncertainty as explanatory variables, ΔEPU_t and EPU_{t-1}. The economic hypothesis is as follows: If ΔEPU_t contains unexpected and relevant information, then we would expect that ΔEPU_t would not be a priced risk and therefore would not show up in the Expected Return analysis in the initial time-windows. Over time, though, we expect the shock will be absorbed into the premium demanded by investors. Thus we expect a positive coefficient in the longer time-window periods. However, if an increase in economic policy uncertainty is a negative shock, then the Unexpected Returns should decrease. Hence we expect that ΔEPU_t will not be statistically significant in the Expected Return regression at first, but later in the time window will become positive. In the Unexpected Return regression we expect it to be negative initially and eventually having no effect.

The hypothesis regarding the level of *EPU* is as follows. If *EPU* affects the price of risk we expect to see it in the Expected Return regression. Specifically, we expect a positive relationship between *EPU* and the price of risk, and hence predict higher returns following heightened *EPU* and a positive coefficient. We have no theory on what the coefficient on the level of *EPU* in the Unexpected Returns regression should be. If the other predictability variables fully reflect the extent of return predictability, and the level of *EPU* adds no new predictability, then the coefficient should be no different than zero. On the other hand, the coefficient would be negative if it predicts low future unexpected returns, and positive if it predicts high future unexpected returns.

We follow Santa-Clara and Valkanov (2003) and decompose monthly holding period returns into expected and unexpected components to determine their relationships with ΔEPU_t and EPU_{t-1}. For each country, *j*, and month, *t*, we consider the monthly holding period return. To decompose the returns into their expected and unexpected components we follow a three-step process. First, we regress the realized returns in period *t* on the predictors of market returns – the controls in Equation 3: the beginning of the month dividend yield, DP_{t-1}, the term spread TSP_{t-1}, the short-term treasury rate $BILL_{t-1}$, the monthly stock market Volatility VOL_{t-1}, and the U.S. Default Spread, $SPREAD_{t-1}$:

$$r_{j,t} = \alpha + \beta_{1j} DP_{j,t-1} + \beta_{2j} TSP_{j,t-1} + \beta_{3j} BILL_{j,t-1} + \beta_{4j} VOL_{j,t-1} + \beta_{5j} SPREAD_{t-1} + \varepsilon_{j,t}. \quad (12)$$

Second, we use the estimated coefficients from Equation 12 to calculate the predicted, or expected, return:

$$\mathrm{E}(r_{j,t}) = \alpha + \widehat{\beta_{1}}_{j} DP_{j,t-1} + \widehat{\beta_{2}}_{j} TSP_{j,t-1} + \widehat{\beta_{3}}_{j} BILL_{j,t-1} + \widehat{\beta_{4}}_{j} VOL_{j,t-1} + \widehat{\beta_{5}}_{j} SPREAD_{j,t-1}. \quad (13)$$

The residual is the surprise, or unexpected return:

$$\widetilde{r_{j,t}} = r_{j,t} - E(r_{j,t}). \tag{14}$$

Finally, we regress the expected and unexpected returns on *ΔEPU* and *EPU*:

$$E(r_{j,t}) = \alpha + \beta_1 \Delta EPU_{j,t} + \beta_2 \, EPU_{j,t-1} + \eta_{j,t} \tag{15}$$

$$\widetilde{r_{j,t}} = \alpha + \beta_1 \Delta EPU_{j,t} + \beta_2 \, EPU_{j,t-1} + \nu_{j,t} \tag{16}$$

In each regression step, we use heteroskedasticity-robust and month-clustered standard errors. Table 9 Panel A presents estimates of Equation 15. Table 9 Panel B presents estimates of Equation 16.

INSERT TABLE 9 ABOUT HERE

Table 9 Panel A reports the results for the expected return analysis, Panel B for the unexpected returns. Panel A, Column 1, Row 1 indicates that a 1% increase in *ΔEPU* corresponds to a positive although statistically insignificant effect on the contemporaneous expected returns. However, after the first month (starting in Row 2) the effect becomes statistically significant and positive at 67.4 basis points. The effect builds by around 30 to 50 basis points for most of the remaining months. This suggests that while the shock itself has only a modest impact on expected returns, the effect it has on the level of *EPU*, does indeed become an influential factor in determining the risk premium. Hence a positive shock to *ΔEPU* corresponds to an economically large persistent increase in expected returns that lasts for years.[12]

The positive relationship between economic policy uncertainty and expected returns is further verified by the level variable, *EPU*. Column 3 focuses on the preexisting level of economic policy uncertainty in time t-1. If the risk premium observed in Column 1 and in the Fama Macbeth analysis in Table 6 is driven by the level of EPU, then we expect higher future expected returns when current EPU is high. The first row shows a strong statistically significant coefficient of 0.729. As the horizon of the cumulative return is stretched out further, the coefficient almost uniformly increases by about 50 to 100 basis points, and the effect lasts for the full two year horizon of study. Columns 2 through 24 show that the effect is persistent into the future. This is true above and beyond the persistent effect a new shock to *EPU* has on expected returns.

Pastor, Sinha and Swaminathan (2008) also find a positive relationship between conditional market expected returns, as measured by implied cost of capital, and conditional volatility of market returns. Similarly, we find international evidence that contemporaneous increases in *ΔEPU* are associated with contemporaneous increases in volatility, and that higher levels of *EPU* are associated with higher expected returns, consistent with a positive mean-variance relationship between risk and return over time in market returns.

The estimates for unexpected returns in Panel B are drastically different from those found in Table 9 Panel A. Column 1, Row 1 shows that a 1% increase in *ΔEPU* is associated with a 2.807% drop in contemporaneous unexpected returns. Recall from Table 4 that an increase in *ΔEPU* is also associated with an increase in (conditional) *volatility*. Our results are consistent with the Glosten et al. (1993) negative relationship between unexpected returns and conditional volatility.

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[12] When investment decreases, the riskiest marginal projects likely will be eliminated first, hence EPU risk may "crowd out" non-EPU risk. Even so, we see increased risk premiums in spite of the fact that the adopted projects are less risky than they would be otherwise.

The shock to EPU is fully realized in the unexpected returns in a contemporaneous drop in prices. A 1% higher level of one-period lagged *EPU* is associated with lower, but statistically insignificant, unexpected returns. Policy uncertainty is rapidly priced into the market and only the temporary price drop from a contemporaneous increase in economic policy uncertainty manifests itself in unexpected returns. As the return window expands to two months, the effects of the EPU shock are no longer noticeable in the unexpected component of returns.

VI. Conclusion

Government economic policy, including taxation, expenditure, monetary and regulatory policy, has large, market-wide economic effects that are largely non-diversifiable. Economic agents make real economic decisions based on expectations about the future economic policy environment. Thus, even market-benevolent policymakers can increase risk by generating an environment of uncertainty about their future economic policy decisions.

This paper extends the Baker, Bloom and Davis (2012) measure to an international setting, creating a news-based index of economic policy uncertainty for a cross-section of countries in order to determine the effects of economic policy uncertainty on asset prices. This measure appears to be the first that quantifies the degree of economic policy uncertainty in an asset pricing study. It is positively correlated, but distinct from general economic uncertainty. Changes in economic policy uncertainty are in fact associated with significant cash flow and discount-rate effects. Increases in economic policy uncertainty are negatively associated with decreases in U.S. GDP for one quarter in the future. This is driven by a decrease in private investment and consumption. The effect results in a one-time level downward shift with growth presuming its regular rate thereafter.

The effect of economic policy uncertainty goes beyond a one-time shift in cash-flows. A 1% increase in the economic policy uncertainty is associated with a contemporaneous 2.807%

decrease in the one-month unexpected return on the country-level market index. However, a 1% increase in the level of economic policy uncertainty is associated with a 72.9 basis point increase in expected one-month returns the following month, an effect that remains significant after two years. This paper shows that economic policy uncertain has sizeable and enduring asset pricing consequences.

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Figure 1: VIX and Economic Policy Uncertainty

This figure plots the monthly U.S. Economic Policy Uncertainty Index (EPU) as well as the monthly-averaged Chicago Board Options Exchange S&P 500 Volatility Index (VIX) over the months January 1990 through March 2012. *EPU* is given by

$$EPU_{j,t} = \text{Ln}\left(100 * \frac{\text{Number of Economic Policy Uncertainty Articles}_{j,t}}{\text{Total Number of Articles}_{j,t}}\right).$$

$Total\ Number\ of\ Articles_{j,t}$ denotes the number of articles in month t about country j in the Access World News database that mention the terms "United States" and "today". $Number\ of\ Economic\ Policy\ Uncertainty\ Articles_{j,t}$ denotes the number of articles in the Access World News database in month t that mention country j, policy (i.e. budget, central bank, deficit, federal reserve, policy, regulation, spend or tax) and uncertainty (ambiguous, indecision, indefinite, indeterminate, questionable, speculative, uncertain, unclear, unconfirmed, undecided, undetermined, unresolved, unsure, vague, or variable).

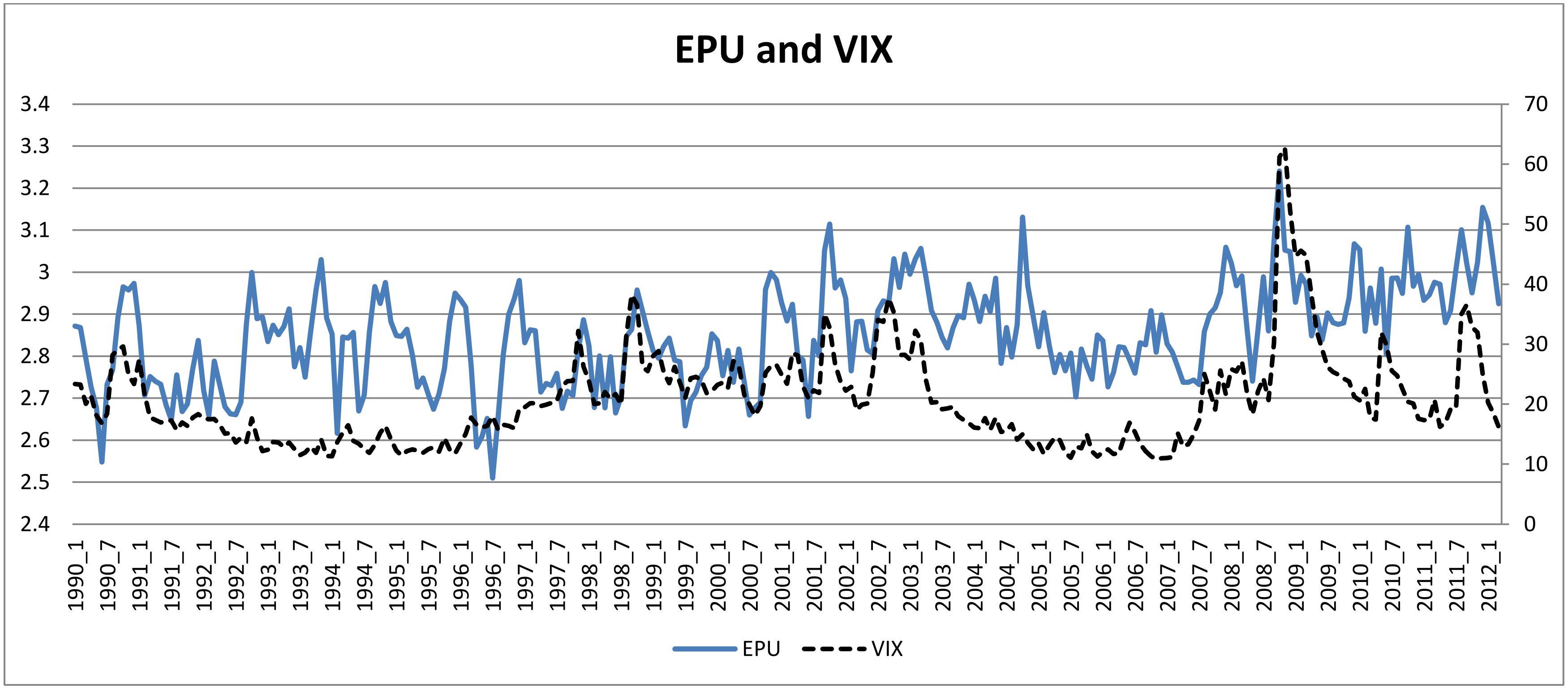

Figure 2: US Stock Returns and Economic Policy Uncertainty

This figure plots the U.S. Economic Policy Uncertainty Index (EPU) as well as the monthly return of the Datastream Total Market Return Index (TRI) for the United States over the months January 1990 through March 2012. *EPU* is given by

$$EPU_{j,t} = \text{Ln}\left(100 * \frac{\text{Number of Economic Policy Uncertainty Articles}_{j,t}}{\text{Total Number of Articles}_{j,t}}\right).$$

$Total\ Number\ of\ Articles_{j,t}$ denotes the number of articles in month t about country j in the Access World News database that mention the terms "United States" and "today". $Number\ of\ Economic\ Policy\ Uncertainty\ Articles_{j,t}$ denotes the number of articles in the Access World News database in month t that mention country j, policy (i.e. budget, central bank, deficit, federal reserve, policy, regulation, spend or tax) and uncertainty (ambiguous, indecision, indefinite, indeterminate, questionable, speculative, uncertain, unclear, unconfirmed, undecided, undetermined, unresolved, unsure, vague, or variable).

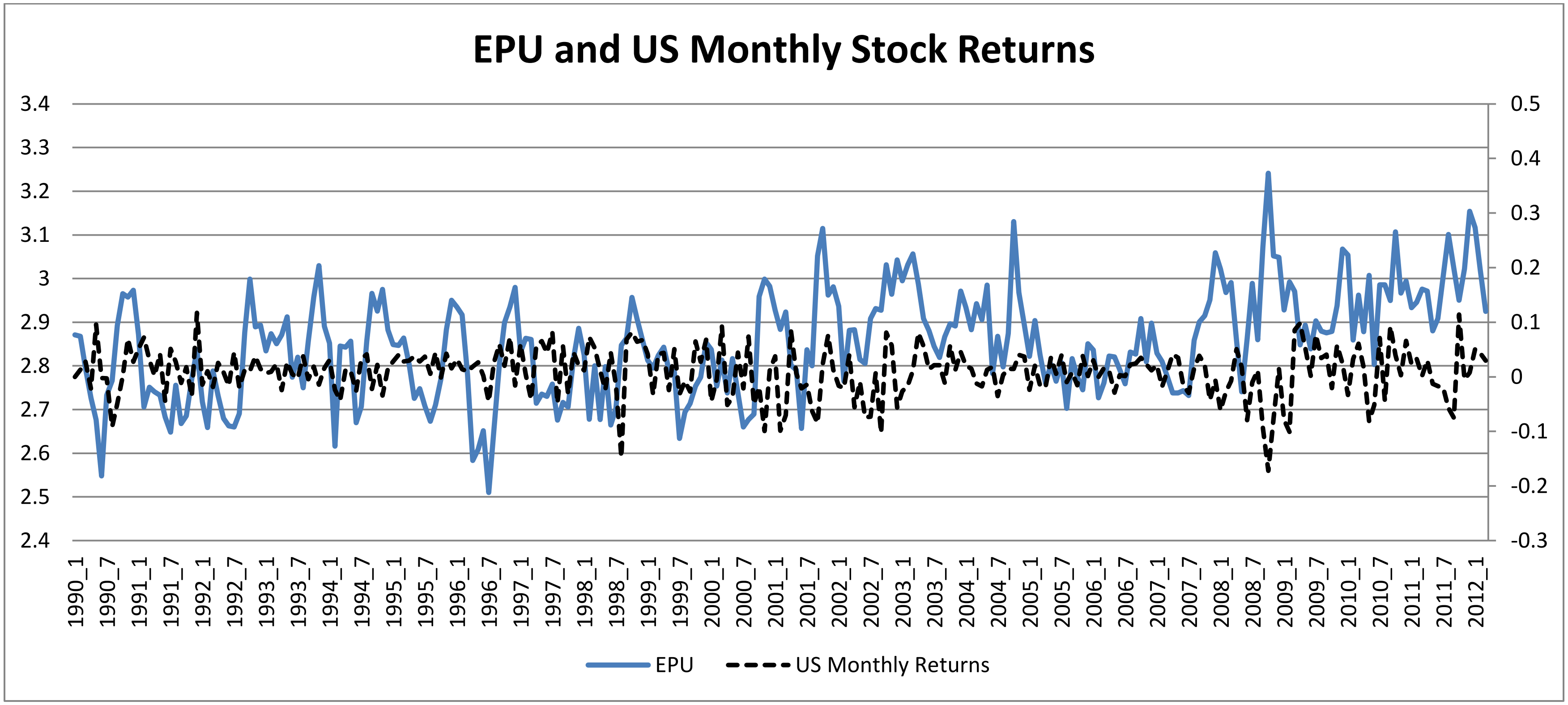

Figure 3: EPU Factor Portfolio Returns

This figure plots the monthly returns of the economic policy uncertainty factor-mimicking portfolio. Each month, we estimate Equation 5 for each stock i over the previous 60 months and sort stocks into equal-weighted β^{EPU} quintiles. Concatenating these portfolio returns yields five portfolio return series. The economic policy uncertainty factor-mimicking portfolio is the zero-investment long short-portfolio whose returns are given by subtracting the returns of the highest β^{EPU} quintile (least risky) from those of the lowest β^{EPU} quintile.

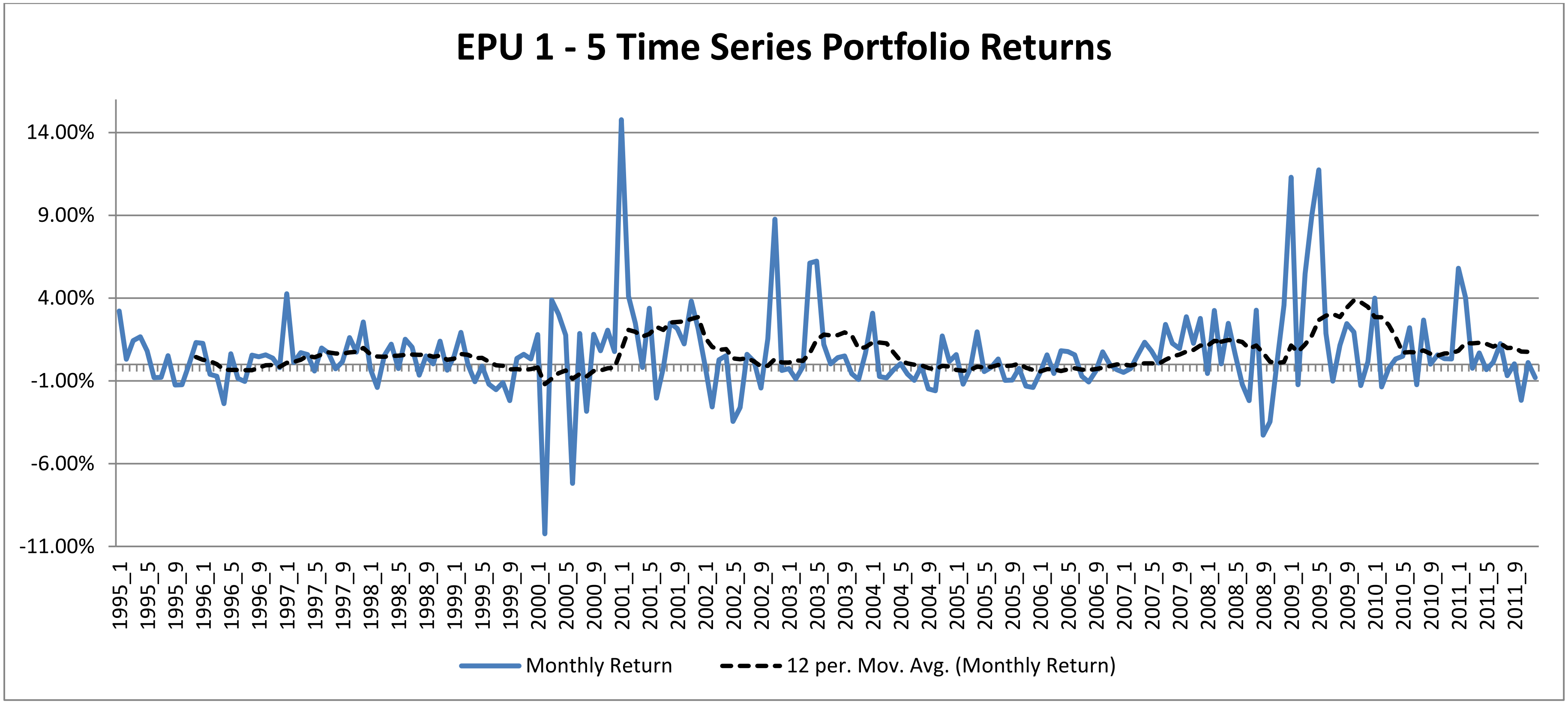

Table 1: Sample Countries

This table lists the 21 countries for which we have formed the Economic Policy Uncertainty Index (EPU) as well as means and standard errors for the levels and first differences of *EPU* and a measure of general uncertainty (*Uncertainty*). $Uncertainty_{jt}$ is the standard deviation of daily returns for country j in month t given by the Datastream Total Return Index.

			Economic Uncertainty		General Uncertainty		ΔEconomic Uncertainty		ΔGeneral Uncertainty	
Country	**N**	**Sample Period**	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Australia	267	1990-2012	2.636	(0.00980)	0.0812	(0.0257)	0.000225	(0.00954)	0.000416	(0.0228)
Brazil	211	1994-2012	2.629	(0.0243)	0.600	(0.0322)	0.00657	(0.0188)	-0.00383	(0.0288)
Canada	267	1990-2012	2.611	(0.0102)	0.0307	(0.0300)	0.00134	(0.00900)	0.00172	(0.0248)
China	223	1993-2012	2.953	(0.0108)	0.822	(0.0328)	-0.000108	(0.00925)	0.00250	(0.0289)
England	267	1990-2012	2.602	(0.00566)	0.141	(0.0289)	-0.000630	(0.00495)	0.00189	(0.0237)
France	261	1990-2012	2.479	(0.00668)	0.329	(0.0274)	0.00152	(0.00671)	0.00201	(0.0236)
Germany	267	1990-2012	2.661	(0.0107)	0.250	(0.0314)	-0.0000628	(0.0103)	0.00132	(0.0273)
Hong Kong	267	1990-2012	3.257	(0.0162)	0.531	(0.0284)	0.00265	(0.0119)	-0.000533	(0.0233)
India	266	1990-2012	2.333	(0.0102)	0.635	(0.0284)	0.00152	(0.00703)	-0.000983	(0.0284)
Italy	262	1990-2012	2.390	(0.0127)	0.404	(0.0292)	-0.00226	(0.0131)	0.00386	(0.0256)
Japan	267	1990-2012	2.838	(0.0112)	0.418	(0.0261)	0.000199	(0.0118)	0.00115	(0.0265)
Korea	267	1990-2012	2.590	(0.0158)	0.737	(0.0293)	0.00290	(0.0153)	-0.00391	(0.0239)
Malaysia	267	1990-2012	2.948	(0.0225)	0.220	(0.0356)	-0.00281	(0.0204)	-0.000556	(0.0290)
Mexico	259	1990-2012	2.672	(0.0105)	0.453	(0.0277)	0.00662	(0.00972)	-0.00440	(0.0262)
Netherlands	267	1990-2012	2.463	(0.00951)	0.196	(0.0332)	0.000499	(0.0110)	0.00284	(0.0242)
Russia	170	1998-2012	2.850	(0.0152)	1.006	(0.0437)	0.00188	(0.0166)	-0.0117	(0.0332)
South Africa	266	1990-2012	2.680	(0.0122)	0.321	(0.0272)	0.00245	(0.00949)	-0.00293	(0.0281)
Spain	267	1990-2012	2.414	(0.0134)	0.341	(0.0281)	0.000631	(0.0125)	0.00404	(0.0253)
Sweden	267	1990-2012	2.368	(0.0186)	0.514	(0.0289)	0.00109	(0.0201)	0.00229	(0.0239)
Switzerland	267	1990-2012	2.665	(0.0157)	0.118	(0.0302)	-0.000316	(0.0166)	0.00101	(0.0290)
United States	267	1990-2012	2.851	(0.00734)	0.185	(0.0294)	0.000200	(0.00558)	0.000282	(0.0227)

Table 2: Country Indicator Correlations

This table presents country-pairwise correlations of the Economic Policy Uncertainty Index (EPU). *EPU* is given by

$$EPU_{j,t} = \text{Ln}\left(100 * \frac{\text{Number of Economic Policy Uncertainty Articles}_{j,t}}{\text{Total Number of Articles}_{j,t}}\right).$$

$Total\ Number\ of\ Articles_{j,t}$ denotes the number of articles in month t about country j in the Access World News database that mention the terms “United States” and “today”. $Number\ of\ Economic\ Policy\ Uncertainty\ Articles_{j,t}$ denotes the number of articles in the Access World News database in month t that mention country j, policy (i.e. budget, central bank, deficit, federal reserve, policy, regulation, spend or tax) and uncertainty (ambiguous, indecision, indefinite, indeterminate, questionable, speculative, uncertain, unclear, unconfirmed, undecided, undetermined, unresolved, unsure, vague, or variable).

	AU	BR	CA	CH	CN	ES	FR	GE	HK	IN	IT	JP	KR	MX	MY	NL	RU	SE	UK	US
BR	0.03																			
CA	-0.01	0.35																		
CH	0.04	0.38	0.57																	
CN	0.10	0.47	0.49	0.44																
ES	0.10	0.57	0.44	0.54	0.58															
FR	0.26	0.39	0.48	0.53	0.33	0.62														
GE	0.13	0.50	0.40	0.54	0.45	0.68	0.71													
HK	0.07	0.28	0.39	0.38	0.72	0.37	0.18	0.25												
IN	0.03	0.42	0.42	0.41	0.54	0.52	0.40	0.38	0.35											
IT	0.11	0.46	0.43	0.57	0.43	0.66	0.64	0.73	0.27	0.33										
JP	0.16	0.50	0.40	0.38	0.49	0.40	0.47	0.60	0.35	0.36	0.44									
KR	0.12	0.53	0.44	0.32	0.57	0.48	0.37	0.41	0.39	0.40	0.33	0.53								
MX	0.11	0.23	0.42	0.27	0.37	0.26	0.22	0.16	0.41	0.37	0.22	0.26	0.25							
MY	0.30	0.22	0.07	0.16	0.37	0.13	0.08	0.11	0.45	0.26	0.16	0.32	0.19	0.38						
NL	-0.03	0.46	0.42	0.49	0.38	0.54	0.52	0.61	0.19	0.33	0.54	0.35	0.35	0.15	0.01					
RU	0.31	0.38	0.31	0.33	0.31	0.24	0.44	0.46	0.12	0.13	0.39	0.49	0.33	0.13	0.15	0.31				
SE	-0.02	0.48	0.48	0.58	0.41	0.55	0.54	0.65	0.18	0.36	0.53	0.42	0.37	0.17	0.01	0.58	0.40			
UK	0.38	0.26	0.22	0.20	0.17	0.28	0.39	0.42	0.16	0.19	0.20	0.40	0.23	0.27	0.18	0.28	0.35	0.30		
US	0.16	0.56	0.70	0.58	0.58	0.67	0.71	0.64	0.32	0.59	0.58	0.57	0.61	0.40	0.07	0.55	0.46	0.59	0.40	
ZA	-0.11	0.58	0.39	0.42	0.55	0.45	0.27	0.51	0.31	0.56	0.41	0.44	0.41	0.17	0.24	0.44	0.24	0.48	0.19	0.50

Table 3: Economic Policy Uncertainty and Stock Returns

Each dependent variable is the one-month total market return for country *j* in month *t*. *EPU* is the Economic Policy Uncertainty Index, defined in Equation 1. *Uncertainty* is the standard deviation of the daily market returns for country *j* in month *t*. *Δ* denotes first differences. Subscript *t* stands for contemporaneous variables, while *t-1* denotes a one-month lag. t statistics based on standard errors double-clustered by country and month are given in parentheses. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
ΔEPU_t	-2.925***		-2.501***			
	(-2.60)		(-2.62)			
$\Delta Uncertainty_t$		-3.890***	-3.849***			
		(-5.15)	(-5.21)			
EPU_t				-3.061**		-1.747*
				(-2.17)		(-1.76)
EPU_{t-1}				2.810**		3.230***
				(2.30)		(3.20)
$Uncertainty_t$					-5.210***	-5.252***
					(-5.56)	(-5.78)
$Uncertainty_{t-1}$					2.654***	2.503***
					(4.06)	(3.92)
Constant	2.028***	1.361***	1.982***	1.875	2.762	-2.307
	(37.05)	(25.02)	(23.13)	(0.42)	(0.31)	(-0.74)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
N	5353	5409	5353	5349	5387	5349
Adj-R^2	0.004	0.042	0.046	0.004	0.063	0.068

Table 4: Economic Policy Uncertainty and Volatility

Each dependent variable is the log of the first difference of the standard deviation of the daily market returns (*ΔVolatility*) for country *j* in month *t*. *ΔEPU* is the Economic Policy Uncertainty Index defined in Table 1. *Dividend Yield* is the Datastream Total Market Dividend Yield Series for country *j* in month *t*. *BILL* is the IMF short-term treasury yield for country *j* in month *t*, where available. For South Korea and Australia *BILL* is the IMF central bank discount rate and average cost of central bank funding respectively. *TSP* is the spread between the IMF long-term treasury yield for country *j* in month *t* and *BILL*. *VOL* is the one-month lagged stock return volatility, and *SPREAD* is the U.S. default spread. t statistics based on standard errors double-clustered by country and month are given in parentheses. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
ΔEPU_t	0.0767		0.182***		0.187***
	(1.35)		(2.70)		(2.89)
ΔEPU_{t-1}		0.188***	0.263***	0.188***	0.265***
		(3.41)	(3.93)	(3.72)	(4.22)
$\Delta Volatility_{t-1}$	-0.341***	-0.347***	-0.346***	-0.359***	-0.358***
	(-9.78)	(-10.03)	(-10.07)	(-10.65)	(-10.66)
$\Delta Dividend\ Yield_t$				-0.392*	-0.398*
				(-1.68)	(-1.71)
ΔTSP_t				0.0744	0.0772
				(0.86)	(0.91)
$\Delta BILL_t$				0.0212**	0.0196**
				(2.17)	(2.13)
Constant	-0.00153	0.000131	-0.00123	0.00160	0.0000585
	(-0.09)	(0.01)	(-0.07)	(0.09)	(0.00)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	4201	4202	4186	3806	3790
Adj-R^2	0.114	0.121	0.127	0.136	0.142

Table 5: Economic Policy Uncertainty and GDP

The unit of observation is a quarter *t* in country *j*. *ΔGDP* is the logged first difference of real gross domestic product, *ΔInvestment* is the logged first difference of aggregate real private investment, *ΔConsumption* is the logged first difference of real personal consumption, and *ΔGovernment* is the logged first difference of government expenditures. *ΔEPU* is the economic policy uncertainty index defined in Table 1. t statistics based on standard errors double clustered by country and month are given in parentheses. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

	ΔGDP	**ΔInvestment**	**ΔConsumption**	**ΔGovernment**
ΔEPU_{t-1}	-0.0672***	-0.125***	-0.0330***	-0.0480
	(-3.37)	(-4.01)	(-2.79)	(-1.53)
ΔGDP_{t-1}	0.327***			
	(3.41)			
$\Delta Investment_{t-1}$		-0.156*		
		(-1.96)		
$\Delta Consumption_{t-1}$			0.652***	
			(7.67)	
$\Delta Government_{t-1}$				-0.106
				(-1.31)
Constant	0.0161***	0.0260***	0.00816***	0.0283***
	(4.69)	(5.91)	(3.46)	(8.48)
N	1578	1522	1522	1522
Adj-R^2	0.216	0.090	0.517	0.062

Table 6: Economic Policy Uncertainty and the Risk Premium

This table presents average excess returns and estimates of abnormal returns for each of the five portfolios formed from sorting on exposure to economic policy uncertainty. Each month m, for each stock i in CRSP, we form five portfolios sorted on estimated β_i^{EPU}, from the following time-series regressions

$$r_{i,t} - r_{f,t} = \alpha + \beta_i^{MKT}(r_{m,t} - r_{f,t}) + \beta_i^{HML} HML_t + \beta_i^{SMB} SMB_t + \beta_i^{EPU} LogEPU_t + \epsilon_{i,t},$$

$$t = m - 60, \dots, m - 1.$$

Panel A presents average excess returns for these five portfolios. Column 1 (EPU_1) reports the results for the most negative β^{EPU} stocks, Column 5 for the least negative. Column 6 (EPU1-5) reports the results for the economic policy uncertainty factor-mimicking portfolio, a zero investment portfolio that is long the highest economic policy uncertainty quintile and short the lowest economic policy uncertainty quintile. Panel B presents whole-sample intercepts and slopes from the Fama-French Three Factors model. That is, for each of the β_i^{EPU} quintiles p, we estimate the following regression over the entire sample period:

$$r_{p,t} - r_{f,t} = \alpha + \beta_p^{MKT}(r_{m,t} - r_{f,t}) + \beta_p^{HML} HML_t + \beta_p^{SMB} SMB_t + \epsilon_{p,t}.$$

Panel C presents whole-sample estimated intercepts and slopes from the Fama-French Three Factors model augmented with the Carhart (1997) momentum factor (*UMD*) as well as the Pastor and Stambaugh (2003) Liquidity factor (*LIQ*):

$$r_{p,t} - r_{f,t} = \alpha + \beta_p^{MKT}(r_{m,t} - r_{f,t}) + \beta_p^{HML} HML_t + \beta_p^{SMB} SMB_t + \beta_p^{UMD} UMD_t + \beta_p^{LIQ} LIQ_t + \epsilon_{p,t}.$$

T statistics are in parentheses.

Panel A: Returns by EPU

	EPU_1	EPU_2	EPU_3	EPU_4	EPU_5	$EPU_{1\text{-}5}$
Return	1.43***	1.08***	0.894***	0.829**	0.8	0.626***
	(2.72)	(2.86)	(2.65)	(2.31)	(1.64)	(3.56)
N	204	204	204	204	204	204

Table 6 Continued

Panel B: Three Factors, by EPU

	EPU_1	**EPU_2**	**EPU_3**	**EPU_4**	**EPU_5**	**EPU_{1-5}**
Mkt - R_f	1.150***	0.947***	0.873***	0.914***	1.058***	0.0926**
	(21.42)	(34.76)	(41.00)	(45.22)	(32.40)	(2.48)
SMB	0.787***	0.516***	0.444***	0.525***	0.931***	-0.145***
	(10.77)	(13.94)	(15.34)	(19.09)	(20.99)	(-2.86)
HML	0.224***	0.454***	0.463***	0.406***	0.145***	0.0790
	(2.93)	(11.68)	(15.25)	(14.09)	(3.12)	(1.49)
Alpha	0.576**	0.340***	0.213**	0.12	-0.0154	0.592***
	(2.31)	(2.69)	(2.16)	(1.28)	(-0.10)	(3.42)
N	204	204	204	204	204	204
Adj-R^2	0.781	0.890	0.917	0.933	0.907	0.063

Panel C: Five Factors, by EPU

	EPU_1	**EPU_2**	**EPU_3**	**EPU_4**	**EPU_5**	**EPU_{1-5}**
Mkt - R_f	0.977***	0.855***	0.812***	0.858***	0.998***	-0.0213
	(21.06)	(37.20)	(41.57)	(46.17)	(30.65)	(-0.64)
SMB	0.854***	0.552***	0.468***	0.547***	0.956***	-0.102**
	(14.44)	(18.85)	(18.78)	(23.08)	(23.02)	(-2.39)
HML	0.105*	0.394***	0.423***	0.366***	0.0942**	0.0110
	(1.67)	(12.62)	-15.96	(14.51)	(2.13)	(0.24)
UMD	-0.397***	-0.208***	-0.137***	-0.131***	-0.149***	-0.248***
	(-10.47)	(-11.07)	(-8.59)	(-8.62)	(-5.61)	(-9.07)
LIQ	0.0786	0.0604**	0.0393*	0.0174	-0.0315	0.110***
	(1.62)	(2.51)	(1.92)	(0.90)	(-0.93)	(3.15)
Alpha	0.821***	0.454***	0.288***	0.207**	0.121	0.700***
	(4.00)	(4.46)	(3.34)	(2.52)	(0.84)	(4.73)
N	204	204	204	204	204	204
Adj-R^2	0.858	0.932	0.939	0.951	0.919	0.346

Table 7: Economic Policy Uncertainty and Future Cash Flows

The unit of observation is a quarter *t* in country *j*. *ΔGDP* is the logged first difference of real gross domestic product, *ΔInvestment* is the logged first difference of aggregate real private investment, *ΔConsumption* is the logged first difference of real personal consumption, and *ΔGovernment* is the logged first difference of government expenditures. The sample runs from 1990q1 through 2012q1. t statistics based on standard errors double-clustered by country and month are given in parentheses. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

	ΔGDP	**ΔInvestment**	**ΔConsumption**	**ΔGovernment**
ΔEPU_{t-1}	-0.0480**	-0.124***	-0.0225	-0.0413
	(-2.03)	(-3.35)	(-1.65)	(-1.05)
ΔEPU_{t-2}	0.0159	-0.0390	0.00728	-0.0289
	(0.72)	(-0.98)	(0.53)	(-0.69)
ΔEPU_{t-3}	-0.00882	-0.0619	-0.00620	-0.0144
	(-0.34)	(-1.53)	(-0.40)	(-0.30)
ΔEPU_{t-4}	0.00481	-0.0175	0.00891	-0.00493
	(0.19)	(-0.42)	(0.51)	(-0.10)
ΔEPU_{t-5}	-0.0422*	-0.0974**	-0.0266	-0.0508
	(-1.79)	(-2.44)	(-1.62)	(-1.18)
ΔEPU_{t-6}	0.0402	0.00599	0.0134	-0.00861
	(1.54)	(0.13)	(0.68)	(-0.19)
ΔEPU_{t-7}	0.00181	0.00324	0.00334	0.0178
	(0.06)	(0.08)	(0.19)	(0.38)
ΔEPU_{t-8}	0.0339	0.0498	0.0225	0.0730*
	(1.61)	(1.42)	(1.48)	(1.93)
ΔGDP_{t-1}	0.347***			
	(3.14)			
$\Delta Investment_{t-1}$		-0.151		
		(-1.62)		
$\Delta Consumption_{t-1}$			0.654***	
			(6.60)	
$\Delta Government_{t-1}$				-0.120
				(-1.32)
Constant	0.0145***	0.0252***	0.0225	0.0267***
	(4.35)	(6.50)	(1.48)	(9.01)
N	1443	1397	1397	1397
Adj-R^2	0.220	0.097	0.512	0.067

Table 8: Economic Policy Uncertainty and Cumulative Returns

For each country, month pair (j,t) and holding window u (months), $r_{jt,t+u}$ denote the cumulative holding period return over month t through $t+u$. This table presents estimates of the regressions

$$r_{j,t,t+u} = \alpha_j + \beta_1 \Delta EPU_{j,t} + \beta_2 EPU_{j,t-1} + \gamma' X_{j,t} + \epsilon_{j,t} \quad u = 0,2,\dots,23$$

where X_{jt} is a set of controls following Ang and Bekaert (2007), Hjalmarsson (2010) and Santa-Clara and Valkanov (2003). They include *Dividend Yield, TSP, BILL, VOL,* and *SPREAD* as defined in Table 4. Each row is a separate regression, with each row in the column *Horizon* denoting the length of cumulative returns from time t being used as the dependent variable. For each country, the time-series of holding periods overlaps by $u-1$ time periods, so we use Newey-West standard errors with the appropriate bandwidth to account for the resulting autocorrelation (as well as clustering by month to control for cross-sectional correlation). T-statistics are in parentheses to the right of the coefficient. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

Horizon	ΔEPU_t		EPU_{t-1}		Adj-R^2
t	-2.685**	(-2.14)	-0.436	(-0.37)	0.011
t+1	-2.938	(-1.43)	0.998	(0.51)	0.020
t+2	-0.914	(-0.44)	2.544	(1.00)	0.025
t+3	-0.773	(-0.32)	2.668	(0.81)	0.034
t+4	-1.616	(-0.55)	3.814	(0.95)	0.048
t+5	-0.655	(-0.21)	5.693	(1.24)	0.060
t+6	0.535	(0.17)	7.963	(1.52)	0.069
t+7	2.291	(0.75)	9.538	(1.54)	0.077
t+8	3.371	(0.89)	10.00	(1.38)	0.081
t+9	3.233	(0.78)	11.27	(1.37)	0.084
t+10	3.276	(0.70)	12.89	(1.44)	0.089
t+11	4.980	(1.01)	15.20	(1.55)	0.093
t+12	5.973	(1.13)	16.72	(1.59)	0.098
t+13	6.393	(1.13)	18.02	(1.60)	0.102
t+14	7.364	(1.22)	20.17*	(1.70)	0.107
t+15	8.295	(1.27)	21.85*	(1.82)	0.113
t+16	9.867	(1.57)	22.27*	(1.87)	0.117
t+17	10.34	(1.56)	21.68*	(1.82)	0.120
t+18	9.981	(1.55)	20.42*	(1.68)	0.122
t+19	9.373	(1.44)	16.50	(1.31)	0.126
t+20	5.732	(0.81)	13.07	(0.99)	0.129
t+21	4.770	(0.68)	11.71	(0.87)	0.134
t+22	3.674	(0.51)	11.83	(0.85)	0.139
t+23	4.153	(0.55)	13.17	(0.94)	0.143

Table 9: Economic Policy Uncertainty and Expected and Unexpected Returns

Following Santa-Clara and Valkanov (2003), we decompose cumulative holding period returns into expected and unexpected components to determine their relationships with ΔEPU and EPU. For each country, month pair (j,t) and holding window u (months), $r_{jt,t+u}$ denote the cumulative holding period return over month t to t+u. The *expected cumulative holding period return* $E_t[r_{jt,t+u}]$ is formed by taking $E_t[r_{j,t,t+u}] = \hat{\alpha} + \hat{\beta}'X_{jt}$ from the regression $E_t[r_{j,t,t+u}] = \alpha + \beta'X_{j,t} + \epsilon_{j,t}, u = 0,2, \dots ,23$ where X_{jt} is the set of controls defined in Table 4. Then, we take the unexpected holding period return to be $r_{j,t,,t+u} - E_t[r_{j,t,t+u}]$. Panel A presents estimates of the regression of *expected returns* on ΔEPU and EPU. Panel B presents estimates of the regressions of *unexpected returns* on ΔEPU and EPU. Each row is a separate regression, with each row in the column *Horizon* denoting the length of cumulative returns from time t being used as the dependent variable. For each country, the time-series of holding periods overlaps by $u - 1$ time periods so we use Newey-West standard errors with the appropriate bandwidth to account for the resulting autocorrelation (as well as clustering by month). T-statistics are in parentheses to the right of the coefficient. *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively.

	Panel A: Expected Return					**Panel B: Unexpected Return**				
Horizon	**ΔEPU_t**		**EPU_{t-1}**		**Adj-R^2**	**ΔEPU_t**		**EPU_{t-1}**		**Adj-R^2**
t	0.282	(1.53)	0.729***	(3.95)	0.059	-2.807**	(-2.20)	-0.841	(-0.62)	0.002
t+1	0.674**	(2.07)	1.695***	(3.86)	0.071	-3.196	(-1.53)	0.117	(0.05)	0.001
t+2	1.009**	(2.23)	2.437***	(3.39)	0.072	-1.571	(-0.72)	0.810	(0.28)	-0.003
t+3	1.394**	(2.30)	3.357***	(3.16)	0.077	-1.573	(-0.61)	0.575	(0.15)	-0.003
t+4	1.972**	(2.53)	4.660***	(3.14)	0.082	-2.671	(-0.88)	1.230	(0.28)	-0.002
t+5	2.407**	(2.50)	5.708***	(2.97)	0.081	-1.922	(-0.60)	2.531	(0.51)	-0.002
t+6	2.838**	(2.51)	6.792***	(2.91)	0.082	-1.001	(-0.32)	4.033	(0.71)	-0.002
t+7	3.285***	(2.60)	7.898***	(2.91)	0.086	0.410	(0.13)	4.883	(0.73)	-0.002
t+8	3.689***	(2.62)	8.896***	(2.87)	0.085	1.230	(0.31)	4.769	(0.61)	-0.003
t+9	3.970***	(2.60)	9.614***	(2.78)	0.085	0.719	(0.17)	5.122	(0.59)	-0.003
t+10	4.435***	(2.69)	10.74***	(2.84)	0.087	0.518	(0.11)	6.114	(0.66)	-0.002
t+11	4.642***	(2.62)	11.36***	(2.78)	0.086	1.976	(0.39)	7.635	(0.77)	-0.001
t+12	4.891**	(2.56)	12.07***	(2.74)	0.083	2.695	(0.50)	8.369	(0.80)	-0.001
t+13	5.298***	(2.59)	13.02***	(2.75)	0.082	2.856	(0.50)	8.944	(0.80)	-0.001
t+14	5.545***	(2.58)	13.73***	(2.73)	0.082	3.488	(0.57)	9.925	(0.85)	-0.000
t+15	5.826***	(2.59)	14.47***	(2.72)	0.083	3.892	(0.58)	10.67	(0.91)	0.000
t+16	6.225***	(2.63)	15.38***	(2.72)	0.082	5.163	(0.80)	10.42	(0.89)	-0.001
t+17	6.251**	(2.50)	15.53***	(2.58)	0.078	5.411	(0.79)	9.313	(0.79)	-0.001
t+18	5.994**	(2.28)	15.17**	(2.39)	0.075	4.930	(0.74)	7.714	(0.64)	-0.003
t+19	6.199**	(2.25)	15.71**	(2.34)	0.076	4.390	(0.65)	4.148	(0.32)	-0.004
t+20	6.132**	(2.15)	15.78**	(2.24)	0.076	1.025	(0.14)	1.459	(0.11)	-0.005
t+21	5.917**	(1.99)	15.53**	(2.10)	0.077	0.579	(0.08)	0.454	(0.03)	-0.005
t+22	5.992*	(1.93)	15.77**	(2.03)	0.079	-0.506	(-0.06)	0.858	(0.06)	-0.005
t+23	6.108*	(1.91)	16.08**	(2.00)	0.082	-0.100	(-0.01)	2.173	(0.15)	-0.004