

## Special Feature B

# An Index Of Global Economic Policy Uncertainty

by Steven J. Davis<sup>1</sup>

*“The first essential step in the direction of learning any subject is to find principles of numerical reckoning and practicable methods for measuring some quality connected with it.”*

– Lord William Thompson Kelvin, 1883

## Introduction

Democratic decision-making is often messy and fraught with uncertainty about outcomes and economic consequences. The 2016 US election cycle illustrates this claim vividly, as does the United Kingdom’s June 23 referendum in favour of leaving the European Union. Writing in September 2016, *Financial Times* columnist Wolfgang Münchau puts it this way: “Britain’s vote to leave the EU has been the most cataclysmic global political event this year so far. Over the next 12 months, we may see one or more of the following: a victory of Donald Trump in the US; a defeat of Italy’s government in a referendum over constitutional reforms; a Marine Le Pen victory in the French presidential election; a right-wing anti-immigration and anti-euro party becoming Germany’s largest opposition party. Not all these calamities will happen. But one or two might.”<sup>2</sup>

Beyond Western Europe and the US, there are other notable examples of economic uncertainty emanating from political developments. In Brazil, a long and severe recession, an extraordinary wave of corruption investigations, and the recent impeachment and removal of its president have combined to upend the political landscape. Brazil’s new president promises to restore growth by reversing several major policies of his predecessor.<sup>3</sup> His success in this endeavour is highly uncertain. In Turkey, after squashing an attempted *coup d’état* in July, the government set about arresting and firing more than a hundred thousand teachers, military officers, judges, mayors, civil servants, and others.<sup>4</sup> Ten weeks after the failed coup, Moody’s Investor Service downgraded Turkey’s sovereign credit rating—citing external funding risks, slowing growth and “further concerns regarding the predictability and effectiveness of government policy and the rule

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<sup>2</sup> *Financial Times* (2016), “Scare Stories Will Not Stop Populist Insurrections”, 25 September.

<sup>3</sup> *The Economist* (2016), “Time for Temer: The New President Takes over a Country in Crisis”, 3 September.

<sup>4</sup> *New York Times* (2016), “Turkey Uses Post-coup Emergency Decree to Purge Mayors and Teachers”, 9 September; and *New York Times* (2016), “Turks See Purge as Witch Hunt of ‘Medieval’ Darkness”, 16 September.

of law.”<sup>5</sup> The coup attempt and its aftermath have also strained international relations between Turkey and several of its allies.<sup>6</sup>

Autocratic regimes also produce economic uncertainty. Russia’s annexation of Crimea in 2014 and its military incursions in eastern Ukraine led to international sanctions and an uncertain environment that curtailed foreign investment in Russia and contributed to its weak economic performance (European Parliament, 2016). The Russia-Ukraine conflict and its unsettled nature have harmed the Ukrainian economy as well and deterred foreign investment there (Morelli, 2016). China’s aggressive pursuit of sovereignty claims in the South China Sea has raised concerns about threats to ship-borne trade in some of the world’s busiest international waters.<sup>7</sup> Syria has become the epicentre of a many-sided military conflict and humanitarian catastrophe, with highly uncertain long-term consequences. The Syrian conflict has produced a flood of migrants into neighbouring countries and Europe, stoking security fears, creating anxiety about social and economic consequences, and placing enormous strains on the Schengen zone arrangements for free mobility in a borderless Europe.<sup>8</sup>

These recent examples, drawn from many parts of the world, suggest that governments and political processes are important sources of economic uncertainty. Policy-related uncertainty also arises as a consequence of major economic shocks and disruptions. As a leading example, the Global Financial Crisis of 2008–09 confronted policymakers with extraordinary and complex challenges. There was great uncertainty about how policymakers should and would respond to the challenges, and what would be the economic consequences.

Many theoretical analyses show how uncertainty potentially affects investment, hiring, consumption, financing costs, asset prices, output growth and other economic outcomes. Bernanke (1983) points out that high uncertainty gives firms an incentive to delay investment and hiring when investment projects are costly to undo or workers are costly to hire and fire. Once uncertainty recedes, firms increase hiring and investment to meet pent-up demand according to this theory. Other theories show how uncertainty can exert contractionary effects through upward pressure on the cost of finance (e.g., Gilchrist *et al.*, 2014; Pástor and Veronesi, 2013), precautionary spending cutbacks by households (e.g., Giavazzi and McMahon, 2012), underinvestment by risk-averse managers (e.g., Panousi and Papanikolaou, 2012), and the intensification of monopoly pricing distortions (Fernandez-Villaverde *et al.*, 2015). Attention to the detrimental effects of policy uncertainty *per se* dates at least to Friedman (1968) and Rodrik (1991).<sup>9</sup>

In the spirit of Lord Kelvin’s remark 133 years ago, Scott Baker, Nick Bloom and I have set out to measure policy-related economic uncertainty in countries around the world. We tap digital newspaper archives and other text sources to construct a wide range of economic policy uncertainty (EPU) indices. The aim of our newspaper-based measures is to capture uncertainty about *who* will make economic policy decisions, *what* economic policy actions will be undertaken and *when*, and the economic effects of policy actions (or inaction)—including uncertainties related to the economic ramifications of “non-economic” policy matters, e.g., military actions.

<sup>5</sup> Reuters (2016), “Moody’s Cuts Turkey’s Credit Rating to ‘Junk’”, 24 September.

<sup>6</sup> Washington Post (2016), “The Aftermath of Turkey’s Failed Coup Threatens its Ties with Western Allies”, 21 September.

<sup>7</sup> Wall Street Journal (2016), “South China Sea Ruling Increases Uncertainty for Shipping, Trade”, 14 July.

<sup>8</sup> See Baker *et al.* (2015a), Halla *et al.* (2015) and BBC News (2016), “Schengen: Controversial EU Free Movement Deal Explained”, (URL: <http://www.bbc.com/news/world-europe-13194723>), 24 April.

<sup>9</sup> See Bloom (2014) for an overview of the literature on economic uncertainty and its effects, Baker *et al.* (2016) for a fuller list of references to research on policy uncertainty, and Baker *et al.* (2014) for references to related research in political science.

We see the effort to systematically measure policy uncertainty as an essential step toward addressing several important questions. For example, what role does policy uncertainty play in long-term economic performance and in cyclical fluctuations? Do severe contractions and major financial crises impart lasting negative effects on the economy by unsettling the political landscape and raising policy uncertainty? Can policy uncertainty measures sharpen our understanding of asset price behaviour and help explain the volatility of national, industry and firm-level equity returns?

This paper builds on my work with Baker and Bloom to construct a Global Economic Policy Uncertainty (GEPU) Index. The GEPU Index is a GDP-weighted average of national EPU indices for 16 countries that account for two-thirds of global output. Each national EPU index reflects the relative frequency of own-country newspaper articles that contain a trio of terms pertaining to the economy, uncertainty and policy-related matters. As discussed below, the mean value of the GEPU Index is 60% greater from July 2011 to August 2016 than in the previous fourteen and one-half years and 22% greater than in the crisis years of 2008 and 2009.

## Using Newspapers To Quantify Economic Policy Uncertainty

Baker *et al.* (2016) construct indices of economic policy uncertainty based on newspaper coverage frequency. Their modern monthly EPU index for the US relies on 10 major newspapers. Specifically, they search the digital archives of each paper to obtain a monthly count of articles that contain the following trio of terms: “uncertainty” or “uncertain”; “economic” or “economy”; and one or more of the following policy terms: “congress,” “deficit,” “Federal Reserve,” “legislation,” “regulation” or “White House” (including variants like “uncertainties,” “regulatory” and “the Fed”). In other words, to meet their EPU criteria, an article must contain terms in all three categories pertaining to the economy (E), policy (P) and uncertainty (U). They scale the raw count by the total number of articles in the same newspaper and month. For each paper, they then standardise the monthly series of scaled counts to unit standard deviation over time. The final step averages the standardised, scaled counts across the ten papers by month to obtain the monthly EPU index. Thus we can think of the monthly EPU index value as proportional to the average share of newspaper articles that discuss economic policy uncertainty in that month.

A basic question raised by this approach is how to choose the specific terms that determine whether the computer-automated reading classifies an article as “EPU=Yes” or “EPU=No”. Concerns

related to this choice are most acute for the P term set, because many policy-related terms are potentially helpful in flagging articles about economic policy uncertainty. For any given term set, a computer-automated classification is subject to two types of errors: (i) false positives, whereby the computer classifies an article as “EPU=Yes” but a careful human reading of the same article concludes “EPU=No”; and (ii) false negatives, whereby the computer classifies an article as “EPU=No” but a careful human reading concludes “EPU=Yes”. The optimal P term set is far from obvious.

To address this issue, we conducted a large-scale human audit of 12,000 articles drawn randomly from US newspapers. Working under our close supervision, teams of University of Chicago students underwent a training process and then carefully read overlapping subsets of the 12,000 articles, guided by a 65-page reference manual and weekly team meetings. The auditors coded each article as “EPU=Yes” or “EPU=No” in light of the economic policy uncertainty concept we sought to identify, as described above in the Introduction.<sup>10</sup> We then compared these human classifications to the computer-automated classifications implied by tens of thousands of possible P term sets. For each P term set, the computer-automated classification determines a set of false positives and false negatives relative to the human classification. We

<sup>10</sup> For more information on the audit process, see Baker *et al.* (2016) and the Audit Guide at [http://www.policyuncertainty.com/media/Coding\\_Guide.pdf](http://www.policyuncertainty.com/media/Coding_Guide.pdf).

chose as our preferred P term set the one that minimises the sum of false positives and false negatives.

Our approach to measuring policy uncertainty also raises potential concerns related to newspaper reliability, accuracy, bias, and consistency. We undertook several investigations to assess these concerns. First, we created a separate newspaper-based index of equity market uncertainty. Specifically, we used the same newspapers, scaling methods and search criteria—except for dropping the P term set and, instead, requiring an article to contain “stock price”, “equity price” or “stock market”. The resulting index is highly correlated with the VIX, a market-based measure of uncertainty implied by traded equity options. This result demonstrates that frequency counts of suitably selected newspaper articles yield a reasonable proxy for an important type of economic uncertainty—a proof-of-concept for our basic approach.

Second, we find a strong relationship between our newspaper-based EPU Index and other text-based measures of policy uncertainty, e.g., the frequency with which the Federal Reserve System’s Beige Books mention policy uncertainty. Third, we find very similar movements in EPU indices based on right-leaning and left-leaning newspapers, suggesting that political slant does not seriously distort our overall EPU index. Fourth, following Baker, Bloom and Davis (2015b), we show that periods characterised by high (low) levels of policy uncertainty according to our newspaper-based EPU index also exhibit a high (low) frequency of large daily stock market moves triggered by news about government policy. Finally, our EPU indices have a market-use validation: major data providers like Bloomberg, FRED, Haver and Reuters carry our indices to meet demands from banks, hedge funds, corporations and policymakers. This pattern of market adoption suggests that our indices contain useful information for a range of decision-makers.

## An Index Of Global Economic Policy Uncertainty

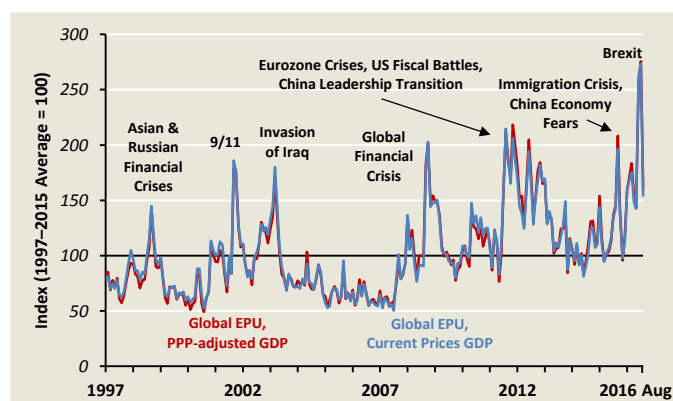
Using similar methods, Baker, Bloom and I also construct monthly newspaper-based EPU indices for 13 other countries: Australia, Brazil, Canada, China, France, Germany, India, Italy, Japan, Russia, South Korea, Spain and the United Kingdom. We perform all searches in the native language of the newspaper. To help develop suitable E, P and U term sets, we consulted persons with native fluency and economics expertise in the relevant language and country. Our P term set differs across countries for reasons both obvious (e.g., using “BOJ” for Japan) and idiosyncratic (e.g., inclusion of “customs duties” for India). Kroese *et al.* (2015) and Zalla (2016) follow our methods to construct EPU indices for the Netherlands and Ireland, respectively. Monthly data for all 16 national EPU indices are available and regularly updated at [www.PolicyUncertainty.com](http://www.PolicyUncertainty.com). The data extend back to 1997 or earlier except for Australia (1998), India (2003), the Netherlands (2003), and Spain (2001).

To construct a Global Economic Policy Uncertainty (GEPU) Index, I proceed as follows. First, I re-normalise each national EPU index to a mean of 100 from 1997 (or first year) to 2015. Second, I impute missing values for Australia, India, the Netherlands and Spain using a regression-based method.<sup>11</sup> This step yields a balanced panel of monthly EPU index values for 16 countries from January 1997 to August 2016. Third, I compute the GEPU Index value for each month as the GDP-weighted average of the 16 national EPU index values, using GDP data from the IMF’s *World Economic Outlook* Database.

Chart 1 plots two versions of the resulting GEPU Index—one based on current-price GDP measures, and one based on PPP-adjusted GDP. The 16 countries that enter into the GEPU Index account for two-thirds of global output on a PPP-adjusted basis and roughly three-quarters of global output at current prices. I will refer to the PPP-adjusted version in remarks below, but the two versions are extremely similar.

<sup>11</sup> For example, I regress the EPU index for Australia from 1998 on contemporaneous EPU index values for all countries with no missing data. I then use predicted values from this regression to impute the missing Australian values for 1997.

**Chart 1**  
**Global Economic Policy Uncertainty**  
**(Jan 1997 – Aug 2016)**



Note: Global EPU is calculated as the GDP-weighted average of monthly EPU index values for the US, Canada, Brazil, UK, Ireland, Germany, Spain, France, Netherlands, Italy, Russia, India, China, South Korea, Japan, and Australia using GDP data from the IMF's *World Economic Outlook* Database. National EPU index values are from [www.PolicyUncertainty.com](http://www.PolicyUncertainty.com) and Baker *et al.* (2016). Each national EPU Index is re-normalised to a mean of 100 from 1997 to 2015 before calculating the Global EPU Index.

The GEPU Index rises sharply in reaction to the Asian and Russian Financial Crises, the 9/11 terrorist attacks, the US-led invasion of Iraq in 2003, the GFC in 2008–09, the European immigration crisis and concerns about the Chinese economy in late 2015, and the Brexit referendum in June 2016.<sup>12</sup> It fluctuates around consistently high levels from mid-2011 to early 2013, a period characterised by recurring sovereign debt and banking crises in the Eurozone, intense battles over fiscal and healthcare policies in the US, and a generational leadership transition in China. Seven of nine members on the Standing Committee, China's most powerful decision-making body, were slated for retirement in 2012. Other senior leadership bodies in China experienced similarly high turnover rates due to retirement, leading Li (2011) to characterise 2012 as the fourth “generational transfer of power” in the history of Communist China. Two of the previous transitions brought tragedy and turmoil in the form of the Cultural Revolution and the 1989 Tiananmen Square protests and massacre.

Eurozone developments in the period from mid-2011 to early 2013 include a rescue package for Portugal in May 2011, a bailout package for Greece in July 2011 (amidst widespread speculation that Greece would leave the Eurozone), large yield increases on Spanish and Italian government bonds in August 2011, April 2012 and June 2012, a May 2012 election in which most Greek voters rejected a proposed bailout agreement, and multiple extraordinary actions by the ECB in response to these and other developments. Across the Atlantic, bitterly partisan disputes over the direction of US fiscal policy led to a “debt-ceiling” fight in summer 2011 that threatened to curtail critical government functions and delay payments on US Treasury securities, and an extraordinary “fiscal cliff” episode with last-minute resolutions of major uncertainties about tax and spending policies. Uncertainties surrounding US healthcare policy were also extraordinarily high in this period. For example, an appellate struck down the Affordable Care Act (“Obamacare”) in August 2011, concluding that Congress lacked the

<sup>12</sup> Brazil also experienced extremely elevated policy uncertainty levels in late 2015 for largely domestic reasons tied to corruption scandals, indictments of major political figures and ultimately successful efforts to remove President Dilma Rousseff from office. These extraordinary developments in Brazil also pushed up the Global EPU Index in late 2015, but they appeared to have limited spillover effects on the rest of the global economy. Brazil's GDP weight in the GEPU Index is about 4%.

constitutional authority to require individuals to purchase health insurance or pay a penalty, and threatening the viability of the entire Act.<sup>13</sup> The issue remained unsettled until June 2012, when the Supreme Court reversed the appellate court in a surprise, closely-divided decision.<sup>14</sup>

The mean value of the GEPU Index is 60% greater from July 2011 to August 2016 than in the

previous fourteen and one-half years. Perhaps even more striking, the mean GEPU Index value since July 2011 is 22% greater than in 2008–09, when policymakers confronted the worst global financial crisis since the 1930s. These findings indicate that policy-related concerns have become a larger source of economic uncertainty in recent years.

## Concluding Remarks

The elevated levels of global policy uncertainty in the past five years compared even to the crisis years of 2008–09 is remarkable. They have contributed to the disappointing performance of the global economy in recent years—the extent of contribution is an open question and an active area of research.

The findings in my research programme with Baker and Bloom also raise other important questions. For example, why have many of the world's

major economies experienced heightened levels of policy uncertainty in recent years? How can we craft institutional arrangements and policy frameworks that foster sound and predictable policy—even, and especially, in the face of large negative shocks? I hope the Global Economic Policy Uncertainty Index and the wide range of other EPU indices available at [www.PolicyUncertainty.com](http://www.PolicyUncertainty.com) will help answer these questions and the ones posed in the Introduction.

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<sup>13</sup> *New York Times* (2011), “Health Law is Dealt Blow by a Court on Mandate”, 12 August.

<sup>14</sup> *Wall Street Journal* (2012), “Court Backs Obama on Health Law,” 29 June.

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