

Though the increasing affordability of books may well have helped to speed the dissemination of the innovations that fuelled the Industrial Revolution, this process was not initiated by legislative reform. If there is a connection between the Glorious Revolution and the Industrial Revolution, it is not in the market for books.

### QUESTIONS TO THINK ABOUT

1. National economic performance is associated with performance in a number of other areas of life, not just politics. For example, the FIFA World Cup is usually won by countries with higher-than-average levels of per capita income. (Even Brazil's per capita income is above the cross-country median.) What might explain this correlation? Which way does the causality go? Note that the players themselves are much more homogeneous than the countries they represent: most of the players are individually very rich and playing club football in high-income countries.
2. If you had to choose an industry for which the Pincus and Robinson view that political development stimulates economic development was most likely to be correct, which one would it be? Why?
3. "In 1985, the European Economic Association (EEA) decided to enter into an agreement with Elsevier, who had been publishing the European Economic Review (EER) since 1969, and designated the EER as its official journal. However,

dissatisfaction at Elsevier's pricing policies persisted. In the light of these concerns, the EEA decided to terminate the agreement with Elsevier, meaning that the EER ceased to be the official journal of the EEA. The EEA decided to launch a new journal, the Journal of the European Economic Association."<sup>9</sup> Should economic researchers send their manuscripts to Elsevier journals such as the EER? Why, or why not?

### REFERENCES

- Acemoglu, D., Johnson, S., Robinson, J. A. "Institutions as a fundamental cause of long-run growth", In Aghion, P., Durlauf, S. N. (eds.), *The Handbook of Economic Growth* (volume 1A), Elsevier, 2005, 385-472.
- Fielding, D., Rogers, S. (2017a), "Monopoly power in the eighteenth-century British book trade", *European Review of Economic History*, 21, 393-413.
- Fielding, D., Rogers, S. (2017b), "Copyright payments in eighteenth-century Britain, 1701-1800", *Library*, 18, 3-44.
- Pincus, S. C. A., Robinson, J. A. (2011), "What really happened during the Glorious Revolution?" *NBER Working Paper*, No. 17206.
- Sher, R., *The Enlightenment and the Book: Scottish Authors and their Publishers in Eighteenth-Century Britain, Ireland and America*, Chicago: University of Chicago Press, 2006.
- Tull, J., *Horse-Hoeing Husbandry* (4<sup>th</sup> edition). London: A. Millar, 1762.

9. This is an abridged version of the text at [eeassoc.org/index.php?site=JEEA&page=187](http://eeassoc.org/index.php?site=JEEA&page=187).

## A new era of uncertainty in the age of globalisation<sup>1</sup>

Tom Fraser & Murat Üngör

tom.fraser@treasury.govt.nz, murat.ungor@otago.ac.nz



Source: [fee.org/articles/fear-the-unknown-how-policy-uncertainty-hurts-growth](http://fee.org/articles/fear-the-unknown-how-policy-uncertainty-hurts-growth)

Over the past decade, the role of uncertainty and its relationship with economic activity has been in the spotlight for policy-makers and economists alike. This is mainly attributed to the occurrence of several momentous events: the 2007-09 global financial crisis (GFC), the European sovereign debt crisis, the rising US fiscal deficit, the 2015-16 refugee crisis, Brexit, and close elections in major economies. For all of these events, politicians and policy assumed a bold role in stabilising and shaping the world economy.

Uncertainty is widely recognised as having a largely detrimental role on economic activity. For example, Federal Open Market Committee (FOMC)<sup>2</sup> minutes have repeatedly emphasised uncertainty as a key factor in the 2001 and 2007-09 recessions

(Bloom, 2014). According to Reifschneider and Tulip (2017), "estimates of uncertainty about future real activity and interest rates are now considerably greater than prior to the financial crisis." Stock and Watson (2012, p. 119) conclude that "the main contributions to the decline in output and unemployment during the recession are estimated to come from financial and uncertainty shocks."

To get a sense of how large the effects of uncertainty actually are, Vanguard, one of the world's largest investment companies, estimates that policy uncertainty has created a US\$261 billion drag on the US economy (McNabb, 2013).

Academic attention on the role of uncertainty in macroeconomic fluctuations has been revived since the seminal contribution of Bloom (2009) which showed that uncertainty shocks are a source of business cycle<sup>3</sup> fluctuations and have temporary negative effects on output growth.<sup>4</sup> More recently, Baker et al. (2016) construct an index of economic policy uncertainty and find that an unexpected increase in this index is associated with a significant and persistent drop in real activity in the US and other industrialised countries.

In this article, we explain what economic policy uncertainty is and how it interacts with economic activity.

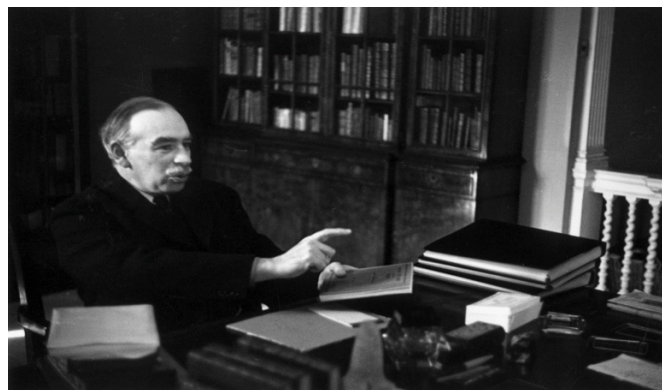
## WHAT IS ECONOMIC UNCERTAINTY?

Economic uncertainty is commonly understood as a situation where the future state of the economy is not known with certainty. Economic uncertainty is not directly observable, however, and is therefore open to interpretation and can take on many definitions.

For example, John Maynard Keynes, one of the most influential economists of the 20<sup>th</sup> century, explains his understanding of 'uncertain' knowledge like this (Keynes 1937, p. 214):

The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth-owners in the social system in 1970. About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know.

*Keynes transformed the lens through which macroeconomics was viewed and studied*



Source: [pbs.org/newshour/economy/john-maynard-keynes-stock-market-past-week](https://pbs.org/newshour/economy/john-maynard-keynes-stock-market-past-week)

## RISK VS UNCERTAINTY

It is also important not to confuse uncertainty with risk. They are different concepts; in short, risk can be thought of as uncertainty that is quantifiable in terms of probabilities.

Frank Knight formalised the distinction between risk and uncertainty in his 1921 book, *Risk, Uncertainty, and Profit*. He reserved the term "risk" for ventures with outcomes described by known probabilities. In contrast, Knight thought that probabilities of returns were not known for many investment decisions and used the term "uncertainty" to refer to such unknown outcomes (Hansen and Sargent, 2011, p. 1100).

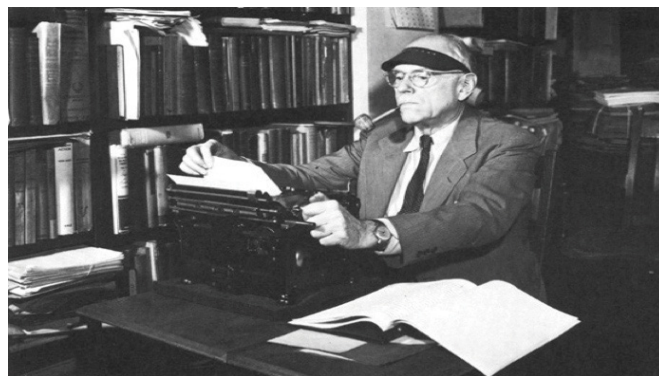
This distinction between risk and uncertainty is important to Knight because whereas risks can be calculated and insured

against, it is uncertainty that paves the way for opportunities to create profit and entrepreneurial enterprises.

In Knight's own words ([1921]1933, p. 233):

The practical difference between the two categories, risk and uncertainty, is that in the former the distribution of the outcome in a group of instances is known (either through calculation a priori or from statistics of past experience), while in the case of uncertainty this is not true, the reason being in general that it is impossible to form a group of instances, because the situation dealt with is in a high degree unique.

*Knight was a cofounder of the highly influential the Chicago school of economics*



Source: [lib.uchicago.edu/projects/centcat/fac/fac\\_img47.html](https://lib.uchicago.edu/projects/centcat/fac/fac_img47.html)

## WHAT IS ECONOMIC POLICY UNCERTAINTY?

Economic *policy* uncertainty (hereinafter referred to as EPU) implies that the future outlook around forms of policy that governments or institutions may implement is unpredictable. This definition is important in making the distinction between EPU and other forms of uncertainty in the economy.

Generally speaking, economic uncertainty takes on a range of definitions stemming from a range of different measurements. Uncertainty in the stock market can be measured by implied volatility; uncertainty around economic growth can be measured by variation in forecasts or predictions of volatile macroeconomic indicators; and uncertainty surrounding other various business conditions can be measured from business reports or in consumer confidence surveys, for example. In contrast, *economic policy uncertainty* differs from general *economic uncertainty* because EPU's measurement exploits data related specifically to policy.

## THE ECONOMIC POLICY UNCERTAINTY INDEX

We live in the age of 'big data'. The dramatic growth of the Internet and the World Wide Web is changing the way we live, work and communicate. Networked computers and electronic devices share trillions of bits of information daily. Enormous amounts of data are collected and stored by individuals, businesses and governments. The big data movement is getting bigger!

How can we extract appropriate and useful knowledge from such huge quantities of data? Organisations implement text and data mining methods and technologies to extract useful information. In simple terms, text mining refers to "the extraction of facts and opinions from a body of text" and data mining refers to "the extraction of trends and patterns from data" (Dyas-Correia and Alexopoulos, 2014, p. 210).

1. Parts of this article are based on the first author's Masters thesis (Fraser, 2018), which was supervised by the second author. The views expressed in this article are those of the authors, and do not necessarily reflect the views of the New Zealand Treasury, where the first author now works.
2. The Federal Reserve System is the central bank of the US. The FOMC makes decisions that help promote the health of the US economy and the stability of the US financial system. The FOMC holds eight regularly scheduled meetings per year. At these meetings, the Committee reviews economic and financial conditions, determines the appropriate stance of monetary policy, and assesses the risks to its long-run goals of price stability and sustainable economic growth ([www.federalreserve.gov/monetarypolicy/fomc.htm](https://www.federalreserve.gov/monetarypolicy/fomc.htm)).
3. Business cycles are the 'ups and downs' in economic activity.
4. Bloom (2014) provides a comprehensive survey of recent literature on macroeconomic uncertainty.

Interest in text mining has gained momentum in economics in recent years.<sup>5</sup> There is a growing literature on developing text-based indicators that can be useful proxies for uncertainty, given uncertainty is not directly observable.

In one of the earliest contributions, Alexopoulos and Cohen (2008, 2009) propose a new index of general economic uncertainty using the number of articles appearing in *The New York Times*. The index uses the terms ‘uncertain’ and/or ‘uncertainty’ and ‘economic’ and/or ‘economy’. This approach has been well received and expanded in a variety of ways by several researchers, most notably by Scott R. Baker, Nick Bloom, and Steven J. Davis (Baker et al., 2016).

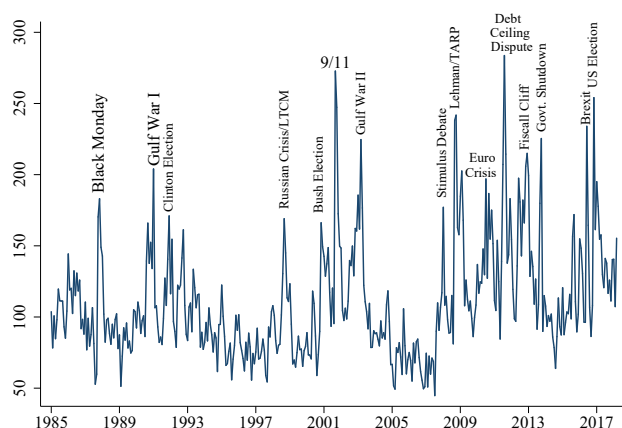
Baker et al. (2016) extend the notion of uncertainty to include economic policy uncertainty (EPU). The researchers construct indices for EPU based on the frequency of terms related to policy uncertainty in newspaper articles. These newspaper-based measures are timely and capture a broad range of uncertainty (Moore, 2017). On their website<sup>6</sup> they frequently update a monthly global index as well as monthly indices for 20 major world economies.<sup>7,8</sup> The index itself is based on newspaper coverage frequency.

The EPU index for the US, for example, is based on the frequency of terms relating to uncertainty in 10 leading newspapers.<sup>9</sup> The authors search the newspapers’ digital archives from January 1985 to obtain a monthly count of articles with the following trio of terms: (i) ‘uncertainty’ or ‘uncertain’; (ii) ‘economic’ or ‘economy’; and (iii) one of the following policy terms: ‘Congress,’ ‘deficit,’ ‘Federal Reserve,’ ‘legislation,’ ‘regulation,’ or ‘White House’ (including variants like ‘uncertainties,’ ‘regulatory,’ or ‘the Fed’). The more frequently the terms appear, the higher is uncertainty in the economy and the more likely there is a spike in the index.<sup>10,11</sup>

The EPU index correctly identifies major political events that cause uncertainty. Figure 1 shows the monthly US News-Based EPU Index from January 1985 to March 2018. The index spikes around the major events in the US: (i) historical events (e.g. Gulf War I, the dissolution of the Soviet Union, 9/11, Gulf War II, the 2007-09 GFC, ‘Brexit’, and Trump’s election), (ii) fiscal or monetary-policy related events (e.g. discussions on the budget, the fiscal cliff and large monetary policy adjustments).

For example, in the figure “Black Monday” refers to Monday October 19 1987 when the stock market, along with the associated futures and options markets, crashed, with the S&P 500 stock market index<sup>12</sup> falling about 20%.

Figure 1: US News-Based Economic Policy Uncertainty Index, 1985: 1-2018:3



Source: [http://www.policyuncertainty.com/us\\_monthly.html](http://www.policyuncertainty.com/us_monthly.html). Accessed 29 April 2018.

## SO HOW DOES THE EPU AFFECT THE ECONOMY?

EPU can affect the economy through a variety of channels. On one hand, governments and governmental institutions have a role to control and stabilise the economy, and therefore in times of uncertainty, the outlook for economic activity could be positive. On the other hand, the effect of EPU on the economy could be negative, as firms and other entities may reduce production, spending and investing until some degree of certainty returns.

The potential relevance of EPU as a cause and/or a consequence of economic fluctuations has motivated the burgeoning literature on the role of economic and/or policy uncertainty. The bulk of the academic research on the subject highlights the negative impact of uncertainty on economic activity, which is mainly transmitted via the investment channel.

In the face of uncertainty, investors tend to opt for a wait-and-see approach and postpone their investment decisions (Jurado et al., 2015). Baker et al. (2016) use their indices (discussed above) to find that at the firm-level, policy uncertainty is associated with higher stock-price volatility and reduced investment and employment. At a macro-level, they find that increased EPU causes declines in investment, output and employment in the US and 12 other countries.<sup>13</sup>

## SOCIAL MEDIA AS A RESEARCH PLATFORM

Although the news-based EPU index is robust, and has been tested against many other measures of uncertainty, it may not be capturing the timing of the shock perfectly, which is prudent, especially when dealing with a monthly time series. An extension from this could be to analyse an index at a higher frequency.

Baker et al. (2016) construct daily EPU indices, and these could be useful as long as the inference is not too noisy. If analysis is applied to a high frequency area, and a daily index is not frequent enough, one may consider constructing an index using the text search aggregation technique on a social media platform, such as Twitter, Google and Facebook.<sup>14</sup>

Twitter, which relies on millions of users, provides arguably the fastest real-time updates on any news event in the world, especially given that almost every journalist is likely to have a Twitter account and the platform has become very mainstream.<sup>15</sup> Meinusch and Tillmann (2017) argue that one of the advantages of using Twitter data for research is that “tweets can be used to extract not only a consensus view on policy but also the degree of uncertainty and disagreement about policy.”

## LESSONS FOR NEW ZEALAND?

The dynamic relationship between economic activity and uncertainty is fascinating to explore for two main reasons: (1) Because uncertainty is unobservable, and therefore finding a quantification method is, in itself, a matter for scrutiny and debate, and (2) because uncertainty can have dramatic effects on the economy, as shown by recent events like the 2007-09 GFC, ‘Brexit’ and the election of US President Trump.

New Zealand’s favourable economic characteristics and small open economy status, which means that the country is constantly affected by global economic fluctuations, makes it a perfect country to analyse.

Rice et al. (2018) explore different methods for quantifying uncertainty in the New Zealand context. The researchers find that a mix of domestic and international events – e.g. the 2010 and

5. See Dyas-Correia and Alexopoulos (2014) and Gentzkow et al. (2017) for comprehensive reviews.

6. [policyuncertainty.com](http://policyuncertainty.com)

7. Australia, Brazil, Canada, Chile, China, Europe, France, Germany, India, Ireland, Italy, Japan, Netherlands, Russia, Singapore, South Korea, Spain, Sweden, UK and US.

8. There is also a daily index for the US, another for the UK, a global monthly EPU index, category-specific indices for the US and Japan, immigration related indices and geopolitical risk indices.

2011 Canterbury earthquakes and the 2012-2013 drought, and 9/11, the Lehman bankruptcy and European economic crises – have increased uncertainty in the New Zealand economy.

According to John McDermott, Assistant Governor and Head of Economics of the Reserve Bank of New Zealand, “these are early days for the growing literature on uncertainty and there is still much to learn” (McDermott, 2017, p. 106).

## QUESTIONS TO THINK ABOUT

1. How should policy-makers think about and deal with uncertainty?
2. What does economic policy uncertainty tell us about macroeconomic fluctuations?
3. Do increases in the EPU index discourage investment? Why?

## REFERENCES

- Acemoglu, D., Hassan, T. A., Tahoun, A. (2018), “The power of the street: Evidence from Egypt’s Arab Spring”, *Review of Financial Studies*, 31, 1-42.
- Alexopoulos, M., Cohen, J. (2008), “Uncertainty and the credit crisis”, VoxEU, [voxeu.org/article/uncertainty-and-credit-crisis-worst-may-be-over](http://voxeu.org/article/uncertainty-and-credit-crisis-worst-may-be-over)
- Alexopoulos, M., Cohen, J. (2009), “Uncertain times, uncertain measures”, University of Toronto, Department of Economics, Working Paper 352.
- Antonakakis, N., Gupta, R. (2017), “Is economic policy uncertainty related to suicide rates? Evidence from the United States”, *Social Indicators Research*, 133, 543-60.
- Bachmann, R., Elstner, S., Sims, E. R. (2013), “Uncertainty and economic activity: Evidence from business survey data”, *American Economic Journal: Macroeconomics*, 5, 217-49.
- Baker, S. R., Bloom, N., Davis, S. J. (2016), “Measuring economic policy uncertainty”, *Quarterly Journal of Economics*, 131, 1593-1636.
- Bloom, N. (2009), “The impact of uncertainty shocks”, *Econometrica*, 77, 623-85.
- Bloom, N. (2014), “Fluctuations in uncertainty”, *Journal of Economic Perspectives*, 28, 153-76.
- Choi, H., Varian, H. (2012), “Predicting the present with Google trends”, *Economic Record*, 88, 2-9.
- Dergiades, T., Milas, C., Panagiotidis, T. (2015), “Tweets, Google trends, and sovereign spreads in the GIIPS”, *Oxford Economic Papers*, 67, 406-32.
- Dyas-Correia, S., Alexopoulos, M. (2014), “Text and data mining: Searching for buried treasures”, *Serials Review*, 40, 210-216.

9. USA Today, Miami Herald, Chicago Tribune, Washington Post, Los Angeles Times, Boston Globe, San Francisco Chronicle, Dallas Morning News, New York Times and Wall Street Journal.
10. The EPU index is also available for 11 US subcategories, including: (i) monetary policy, (ii) fiscal policy (taxes or spending), (iii) taxes, (iv) government spending, (v) health care, (vi) national security, (vii) entitlement programs, (viii) regulation, (ix) financial regulation, (x) trade policy, and (xi) sovereign debt, currency crises. The calculation process is similar to the one used to compute the economic policy uncertainty index ([policyuncertainty.com/us\\_monthly.html](http://policyuncertainty.com/us_monthly.html)). 11. Aside from the EPU index constructed by Baker et al. (2016), there is a wide range of alternative indices used to measure uncertainty. These include ex ante forecast disagreements and ex post forecast errors, business survey data, financial market indicators, and various theoretical approaches. See, for example, Bachmann et al. (2013) and Jurado et al. (2015).
12. Standard and Poor’s 500 index (S&P 500) is a stock market index that tracks 500 publicly traded domestic companies in the US to measure performance of the broad domestic economy.
13. There are also some other studies, outside strict economics, investigating the relationship between EPU and some other variables. For example, Antonakakis and Gupta (2017) find that heightened uncertainty (using the EPU as a proxy) is associated with higher rates of suicide in the male population in the US.
14. There has been a growing interest in the use of social media as a data source for economic analyses. See, for example, Choi and Varian (2012), Dergiades et al. (2015), Acemoglu et al. (2018).
15. As of the fourth quarter of 2017, Twitter had 330 million active users each month on average ([statista.com/statistics/282087/number-of-monthly-active-twitter-users](http://statista.com/statistics/282087/number-of-monthly-active-twitter-users)).

- Fraser, T., *Categorical Economic Policy Uncertainty and Economic Activity*, unpublished Masters thesis, University of Otago, 2018.
- Gentzkow, M., Kelly, B. M., Taddy, M. (2017), “Text as data”, *NBER Working Paper*, No: 23276.
- Hansen, L. P., Sargent, T. J., “Wanting robustness in macroeconomics”, In: Friedman, B. M., Woodford, M. (eds.), *Handbook of Monetary Economics*, Volume 3B. Elsevier, 2011, 1097-1157.
- Jurado, K., Ludvigson, S. C., Ng, S. (2015), “Measuring uncertainty”, *American Economic Review*, 115, 1177-1216.
- Keynes, J. M. (1937), “The general theory of employment”, *Quarterly Journal of Economics*, 51, 209-23.
- Knight, F. H., *Risk, Uncertainty and Profit*, Boston and New York: Houghton Mifflin Company, [1921] 1933.
- McDermott, C. J. (2017), “Policy uncertainty from a central bank perspective”, *Australian Economic Review*, 50, 103-106.
- McNabb, B. (2013), “Uncertainty is the enemy of recovery”, *The Wall Street Journal*, [wsj.com/articles/SB10001424127887323789704578443431277889520](http://wsj.com/articles/SB10001424127887323789704578443431277889520)
- Meinusch, A., Tillmann, P. (2017), “Quantitative easing and tapering uncertainty: Evidence from Twitter”, *International Journal of Central Banking*, 13, 227-58.
- Moore, A. (2017), “Measuring economic uncertainty and its effects”, *Economic Record*, 93, 550-75.
- Reifschneider, D., Tulip, P. (2017), “Gauging the uncertainty of the economic outlook using historical forecasting errors: The Federal Reserve’s approach”, *Federal Reserve Board of Governors Finance and Economics Discussion Series*, No: 2017-020.
- Rice, A., Vehbi, T., Wong, B. (2018), “Measuring uncertainty and its impact on the New Zealand economy”, *Reserve Bank of New Zealand Analytical Notes*, AN2018/1.
- Stock, J. H., Watson, M. W. (2012), “Disentangling the channels of the 2007-2009 recession”, *Brookings Papers on Economic Activity*, Spring 2012, 81-135.

## STAY CONNECTED!

Follow us on Facebook to keep up-to-date with the latest news and events in the Department of Economics at the University of Otago.

Previous issues are available by emailing [econz@otago.ac.nz](mailto:econz@otago.ac.nz) with your request.

Or write to

[EcoNZ@Otago](mailto:EcoNZ@Otago)

Department of Economics  
University of Otago  
Dunedin 9054

Select issues are also available at [econz@otago.ac.nz/economics/news/eco](http://econz@otago.ac.nz/economics/news/eco)

[econz@otago.ac.nz](mailto:econz@otago.ac.nz)  
[facebook.com/OtagoEconomics](https://facebook.com/OtagoEconomics)