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### FROM THE EDITORS

This issue of *EcoNZ@Otago* has a particularly diverse range of articles, ranging from a topic of local (or national) importance – if you live in Auckland – to others of global significance, and from the contemporary to the historical. First up is an article that convincingly shows that Auckland's housing shortage is caused by too few houses being built and that those that are being built are simply too big. The second article is about how human productivity is raised through investments in education, skills and knowledge. The third article investigates the economic impact of England's 'Glorious Revolution' of 1688 on the printing and publishing industry. The fourth article explains what economic policy uncertainty is and how it affects economic activity. As always, the issue finishes with Alan King's commentary on the NZ economy. Thank you for reading our magazine, brought to you by the University of Otago's Department of Economics.

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### Deconstructing Auckland's housing shortage: Too few builders of too large houses for too many people<sup>1</sup>

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Source: stuff.co.nz/business/property/95367215/Building-minister-weighs-in-on-Aucklands-housing-accord

For over a decade, Auckland's housing market has fascinated (horrified?) people who don't live there. How can anyone afford those prices? Does Auckland simply need more houses, or is there a different problem? Why are Auckland's houses so big? And why are people still moving there? This last question is easy to answer: Auckland is a fabulous place to live! But the other questions mystify.

To address these remaining, unanswered questions – specifically, the following two – we undertook a statistical analysis of population and building trends around New Zealand. The first question concerns the extent that Auckland is building too few houses to meet its burgeoning population. The second question is whether the large size of newly constructed houses is causing a housing shortfall.





Parts of this article are based on Coleman and Karagedikli (2018). The views expressed here are those of the authors and do not necessarily reflect the views of the authors' employers, the Productivity Commission and the Reserve Bank of New Zealand.

### TOO FEW NEW HOUSES RELATIVE TO NEW AUCKLANDERS

The basic technique we used is quite simple and is indicated in Figure 1. The horizontal axis shows the percentage population increase in New Zealand's 16 main regions between 1996 and 2016. The vertical axis shows the amount of new housing built in each region, as a fraction of the population. Most of the points lie near the line which represents how many new houses are needed for each additional person in a region.

It is obvious in the figure that compared to NZ's 16 main regions, Auckland is the exception. Auckland experienced a very large population increase, but nowhere near enough houses were built to accommodate these extra people. The statistical techniques we used to estimate how different Auckland is from the rest of the country are a little more sophisticated than eyeballing the graph, but the graph captures the essence of the approach.

Figure 1: Annual average building permits/capita versus population growth 1996-2016



### WHY SUCH A BIG SUPPLY SHORTFALL?

Between 1996 and 2016, Auckland's population increased by 499,000 people – a significant increase in demand. But only 153,000 houses were built to accommodate those new people.

In contrast, the rest of NZ saw a similar increase in population (462,000), but almost twice as many houses were built to accommodate them (304,000). So Auckland has been building houses at about half the rate needed to support its population. Indeed, since 2006 on a per capita basis Auckland has scarcely built more houses than regions like Gisborne or Manawatu or Southland that have had no population growth. No wonder there is a housing shortage in Auckland.

In the rest of the country, approximately one house is built for every three and half new people – whether you live in a fast growing region like the Bay of Plenty or a slow growing region like the Manawatu. If Auckland had built at this rate, an extra 55,000 dwellings would have been constructed between 1996 and 2016.





55,000 homes is a big number – equivalent to about a third of the number of houses that were actually built over the past 20 years or 10% of Auckland's current housing stock. If Auckland had built these houses and construction activity had kept pace with the rest of the country, it's a fair bet that Auckland's house prices and rents would not be so high.

### NOT ALWAYS THIS BAD OF COURSE

Back in 2005, the estimated shortage was slightly fewer than 10,000 homes and mainly concentrated in medium and large size houses. There was no shortage in smaller inner city apartments thanks to a building boom in the early 2000s – a whopping 11,251 consents for apartment dwellings were issued between July 2002 and June 2005.

But then, around the time of the Global Financial Crisis, apartment building suddenly stopped. There were only 786 apartment consents between July 2008 and June 2012, less than a tenth of the earlier rate. As a result, a major shortfall in the number of apartments has built up over the past 10 years. On top of this, the shortfall of medium and large houses has steadily worsened.

Why has apartment construction been so low over the past decade? We don't know exactly, although several reasons are plausible.

New regulations introduced since 2005 have raised the costs of building apartments, making it less profitable for new developments to proceed. The collapse of finance companies in 2006-07 may also have choked off credit to the construction sector, stymieing activity. In any case, it is not clear that there would have been enough builders to keep up with demand.

### NOT ENOUGH BUILDERS

We estimate that Auckland would have needed an extra 9000 construction workers to build enough big, small and mediumsized houses to keep up with Auckland population growth rate. As shown in Figure 3, the net migration of construction workers has not kept up with overall net migration.

Why? Perhaps builders don't migrate to Auckland because planning constraints stop houses from being built, but perhaps wage rates aren't high enough to offset the higher cost of living in Auckland? A vicious circle.

For all the debate about the effect of land market restrictions on Auckland's housing market, it's pretty clear that even if these restrictions were removed, Auckland will still face a shortage unless more builders are found to build more homes. This may not be as easy to fix as it sounds. Construction workers have a long history of leaving NZ to move to Australia whenever there is a housing downturn (such as in 1968, 1978, 1988, 1998 and 2008), and not coming back in the subsequent upturn.

Figure 3. Cumulative migration of construction workers and all groups 1963-2018 (March years)



### **BIGGER IS BETTER?**

The recent enthusiasm for building large homes in Auckland is also worth dwelling on. Over time, Auckland's houses and in NZ more broadly have been getting bigger and bigger. In 1990, less than one third of NZ's new homes were bigger than 150 m<sup>2</sup>; by 2009 over two-thirds were. The size of new homes in NZ appears to have increased faster than anywhere else in the world. We now build some of the largest houses in the world.

This tendency for building large houses helps to explain some of the pressures on Auckland's housing market too. Like the rest of the country, Auckland has been building a lot of big new houses. But it has also needed to build lots of new houses to accommodate a large population increase. Capacity constraints bite when it tries to do both.

### DOES AUCKLAND'S HOUSING SHORTAGE MATTER FOR THE WIDER ECONOMY?

In a word, yes. If you combine rapid population growth with a shortfall in housing, you can create an economic boom and rising house prices. When new people arrive in a district, they create a short-term shortage of workers and an employment boom because so much new construction is needed to house them. New migrants create a demand for more workers. This fact isn't exactly new – it was commented on in the 1950s and 1960s – but it does help to explain why the economy has been buoyant for so long, particularly in Auckland.

### CAN ANYTHING BE DONE?

For some time, solving Auckland land supply issues has been thought to be the key issue. It seems Auckland needs to free up land in the suburbs – and improve transport access to these areas. Auckland also needs to solve the land fragmentation issues that make it difficult to aggregate land into apartment-sized parcels in central city regions.

However, addressing land supply issue is unlikely to be enough. Given the size of Auckland housing shortage, the city needs to attract more builders and build more apartments and houses. Or maybe more Aucklanders will consider moving to other parts of New Zealand ...

#### QUESTIONS TO THINK ABOUT

- 1. Does Auckland's distinctive demographic profile explain why so few houses were constructed in Auckland relative to its population increase?
- 2. Why did the size of new houses increase? And is the increased size of houses a major factor behind Auckland's housing shortage?
- 3. Did Auckland's housing shortfall occur because builders in Auckland constructed unusually large houses over the period?
- 4. How do population and demographic change affect the size of newly constructed houses?

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### What are our MEcon<sup>1</sup> students up to now?



Susie Campbell is currently an intern at the United Nations based in the headquarters of the Economic Commission for Latin America and the Caribbean (ECLAC), in Santiago, Chile.



Finn Robinson now works as an economic analyst in the Reserve Bank. Finn says "As the GDP and Labour Market analyst I provide short-term forecasts for these sectors. The team presents its forecasts to the Monetary Policy Committee who uses them to help formulate monetary policy. It's an exciting time to be at the Reserve Bank, with a new governor and Policy Targets Agreement just around the corner."

1. Masters of Economics

## Towards the knowledge society: Fostering and measuring skills<sup>1</sup>

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Source: buriramtimes.com/ thailands-students-scores

The growth of technological and scientific knowledge in the last two centuries has been the overriding driver of the world as we know it today; knowledge has been the foundation of economic prosperity.2

For example, Jane Gilbert, Chief Researcher at the New Zealand Council for Educational Research 2003-13, argued that "we are supposed to be striving to become a knowledge-based society" (Gilbert, 2005, p. 3). Eric A. Hanushek and Ludger Woessmann also make a strong argument in their book, The Knowledge Capital of Nations, that knowledge capital accounts for much of the income differences across countries (Hanushek and Woessmann, 2015). Knowledge matters!

### HUMAN CAPITAL

The importance of human capital was recognised as far back as the 1600s when Sir William Petty discussed a relationship between the costs of war and the skill level of workers (see Hanushek, 2015). Before then, workers' abilities were not considered to be particularly relevant. Adam Smith wrote in The Wealth of Nations ([1776] 2003, p. 358) that just as important as 'fixed capital' are:

The acquired and useful abilities of all inhabitants or members of the society. The acquisition of such talents, by the maintenance of the acquirer during his education, study, or apprenticeship, always costs a real experience, which is a capital fixed and realised, as it were, in his person. Those talents, as they make a part of his fortune, so do they likewise of that of the society to which he belongs. The improved dexterity of a workman may be considered in the same light as a machine or instrument of trade which facilitates and abridges labour, and which, though it costs a certain expense, repays that expense with a profit.

In the second half of the twentieth century, interest in the value of acquired abilities was revived by considering how productivity is raised through investments in education, skills and knowledge. Scholars such as Gary S. Becker, Theodore W. Schultz, and Jacob Mincer pioneered the human capital approach in the late 1950s and early 1960s.<sup>3</sup>

Becker was influential in including human capital formulations into theoretical and empirical work, transforming the perspective of economics by making humans the central focus. Since his seminal 1964 book, Human Capital, human capital theory has been used to understand many facets of economic development. Becker emphasised the importance of human capital investment by relating earnings inequality to differences in talents, family backgrounds and other assets, motivated by the attempt to calculate private and social returns from investment in education.<sup>4</sup>

### QUALITY VERSUS QUANTITY

Most literature on economic development uses average years of schooling data as a proxy for human capital.<sup>5</sup> But this quantitative perspective of human capital relies on two strong - and controversial - assumptions.

The first assumption is that a year of schooling is equally effective at raising someone's productivity regardless of where in the world the year of schooling is obtained. The second assumption is that other factors such as individuals' abilities, health and so on have negligible effects on human capital.

These two assumptions imply, among other things, that workers with the same educational achievement (in terms of years of schooling) embody similar amounts of cognitive skills. This is troublesome. According to Hanushek and Woessmann (2008, p. 608);

Parts of this article are based on the first author's Masters thesis (Campbell, 2018), which was supervised by the second author

In The Gifts of Athena, celebrated economic historian Joel Mokyr argues that knowledge is the key to understanding many of the most important developments in the last two centuries 2. (Mokyr, 2002).

З In 1962, for example, the Journal of Political Economy published a special issue on human capital with several landmark papers.

nobel prize org/nobel\_prizes/economic-sciences/laureates/1992/becker-lecture.html Previous research in empirical growth literature has used school enrolment rates to proxy for investment in educational human capital (e.g. Mankiw et al., 1992), whereas data on average 5 years of schooling have been widely used to proxy for stocks of educational human capital

Most people would, in casual conversation, acknowledge that a year of schooling in a school in a Brazilian Amazon village was not the same as a year of schooling in a school in Belgium. They would also agree that families, peers, and others contribute to education. Yet, the vast majority of research on the economic impact of schools – largely due to expedience – ignores both of these issues. The data suggest that the casual conversation based on disparities in school attainment may actually understate the magnitude of differences in true education and skills across countries.

*The Economist* magazine looks at the case of India and discusses the fact that although more Indians than ever are attending school, learning is not improving. According to Yamini Ayar of the Centre for Policy Research (a think-tank in Delhi), "we have failed miserably in translating school into learning" (*The Economist* 2017, p. 21). McKinsey (2010, p. 20) reached a similar diagnosis for Africa:

There is mounting evidence from surveys in Africa and in other developing countries that basic skills in reading and mathematics remain low. In some African countries, student test scores have stagnated or even declined ... In a South African survey, just 37% of respondents correctly answered more than half of 'real-life' math questions (e.g. A shop has 126 litres of milk. 87 litres are sold. How many litres remain?).

Recent evidence identifies the shortcomings of measuring human capital by only considering schooling attainment, and highlights the importance of the knowledge that is actually acquired. Many international tests are available for measuring the quality of education, but relying on such tests begs the following important questions. How do international test scores shape education policy-making? Do they effectively represent and measure what we want for all our young people? Can competencies assessed by tests be considered the fundamental school knowledge that children and teenagers should possess?

We consider these three international tests in turn below: the Programme for International Student Assessment (PISA), Trends in International Mathematics and Science Study (TIMSS) and the Progress in International Reading Literacy Study (PIRLS).

#### PISA

Launched by the OECD in 1997, the Programme for International Student Assessment (PISA) represents an attempt to monitor the outcomes of education systems worldwide in terms of student achievement, providing comparable data across countries on how to improve educational policies and outcomes.

Administered on a three-year cycle, PISA evaluates 15 year olds in three key learning areas: science, mathematics and reading. Approximately 540,000 students completed the assessment in 2015, representing around 29 million 15 year-olds in the schools of the 72 participating countries and economies.<sup>6</sup>

Table 1 reports the means and standard deviations of PISA test scores for the 32 countries that participated in all rounds of testing between 2000 and 2015.<sup>7,8</sup> The highest mean score in mathematics belongs to Korea (543.4), whereas the lowest mean is for Brazil (368.5). For the science test, Finland has the highest value (546.6), whereas the lowest is Indonesia (391.6); the same pattern is evident for the reading score: Finland has the highest score (537.2) and Indonesia the lowest (390).

Gary Becker taught at the University of Chicago for more than 30 years.



Source: news.uchicago.edu/article/2014/05/04/gary-s-becker-nobel-winning-scholar-economics-and-sociology-1930-2014

6. oecd.org/pisa/pisa-2015-results-in-focus.pdf

There is one exception: the US participated in every round, but their scores for the reading test in 2006 are not available. There was an error with the printing of the exam booklets, which was deemed to have invalidated the data, but the estimated effect of the error on the mathematics and science scores were agreed to be negligible. oecd.org/pisa/data/42025182.pdf
 Xiang and Yeaple (2017) present a similar table tabulating over-time changes of PISA scores.

Table 1. Within-country	over-time variations	of PISA scores,	2000-2015
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COUNTRY		MEAN SCORES		STANDARD DEVIATION			
	Mathematics	Science	Reading	Mathematics	Science	Reading	
Australia	515.0	523.0	516.0	14.2	6.8	9.4	
Austria	502.0	500.3	486.3	4.5	7.9	8.2	
Belgium	517.7	504.7	504.7	7.4	5.3	4.0	
Brazil	368.5	393.8	402.9	20.6	11.1	7.2	
Canada	525.5	527.4	527.2	7.2	5.2	3.9	
Czech Republic	501.3	508.2	486.9	9.7	10.5	5.5	
Denmark	509.4	492.0	495.8	6.2	11.1	2.5	
Finland	533.2	546.6	537.2	14.9	11.6	10.1	
France	501.4	499.9	498.2	10.1	6.0	6.6	
Germany	504.8	509.8	497.4	8.6	13.6	9.6	
Greece	454.0	467.8	472.1	7.8	9.3	8.0	
Hungary	485.5	496.2	482.7	6.7	10.3	8.3	
Iceland	503.8	488.1	491.2	11.2	9.9	10.4	
Indonesia	375.1	391.6	390.0	11.7	8.1	11.7	
Ireland	499.9	509.9	516.5	6.3	6.9	11.0	
Italy	473.8	483.7	482.0	13.8	7.0	8.2	
Japan	535.3	542.3	515.4	11.4	7.2	15.4	
Korea	543.4	534.0	534.6	10.2	13.0	13.2	
Latvia	481.2	487.5	481.4	9.6	14.3	12.1	
Luxembourg	482.3	478.4	473.6	18.1	17.6	16.6	
Mexico	403.0	413.8	417.4	13.7	5.8	10.2	
New Zealand	516.1	523.3	519.0	15.7	7.9	7.1	
Norway	495.6	494.0	501.6	5.1	7.0	9.6	
Poland	495.4	502.3	501.3	15.7	14.1	13.1	
Portugal	475.2	480.7	482.5	15.3	16.2	10.9	
Russia	477.7	480.0	462.2	9.8	10.6	20.6	
Spain	482.5	490.7	483.1	3.7	3.5	12.5	
Sweden	497.9	499.2	503.1	11.8	9.9	12.2	
Switzerland	528.6	509.6	499.1	4.3	7.8	5.8	
Thailand	421.2	429.5	423.2	6.8	9.1	11.3	
United Kingdom	502.0	517.0	502.8	14.6	7.9	11.1	
United States	481.5	495.9	498.8	8.5	5.0	3.6	

Source: OECD PISA, oecd.org/pisa/data

With respect to Finland's highly successful education system, according to the World Bank's Cristian Aedo:<sup>9</sup>

Finland is an example of a country that has not followed many of the global education reform principles. There is no standardised tests or school inspections but the education system leans on "intelligent" accountability. This means that while there are national quality standards for learning and teaching in the form of national core curriculum and laws and regulations, there are no rankings of the schools based on test results. However, self-evaluation of schools and education providers exists and are regularly applied. Finland: An educational miracle?



Source: blogs.worldbank.org/education/miga/category/tags/pisa (Photo: World Bank)

### TIMSS

Developed by the IEA (International Association for the Evaluation of Educational Achievement) in 1995, Trends in International Mathematics and Science Study (TIMSS) began its first four-year cycle assessing student performance in mathematics and science and describing the environment in which students acquired these skills.

Both PISA and TIMSS cover similar material and test 8th-graders (13-14 year olds). Figure 1 plots the scores obtained by participating countries in the mathematics and science examination of these two tests in 2015, where 28 countries participated in both rounds of testing.<sup>10</sup> Scores are highly correlated: for the mathematics test, the correlation is of 0.924, and for science, 0.920.

Figure 1. Performance in mathematics and science: TIMSS vs. PISA, 2015



### PIRLS

Also developed by the IEA, Progress in International Reading Literacy Study (PIRLS) tests student achievement in reading every 5 years. The first study was conducted in 35 countries in 2001, and was designed to measure trends in achievement of primary school students in each cycle, as well as collect background information.<sup>11</sup>

### WHAT ABOUT NONCOGNITIVE SKILLS?

A weakness of international test scores is that they neglect noncognitive human capital, such as conscientiousness, conformity, motivation, perseverance, tenacity and trustworthiness, which are like to be important too. For reasons of data availability, the focus of skills measurement is usually just on cognitive skills, whereas noncognitive skills are not adequately captured by IQ tests and achievement tests.

According to Heckman<sup>12</sup> and Rubinstein (2001, p. 145), "no single factor has yet emerged to date in the literature on noncognitive skills, and it is unlikely that one will ever be found, given the diversity of traits subsumed under the category of noncognitive skills." Similarly, Hanushek and Woessmann (2011, p. 95) write that "the systematic measurement of such skills has yet to be possible in international comparisons." Kautz et al. (2014) provide a comprehensive discussion of recent attempts by psychologists and economists to develop reliable measures of noncognitive skills. We look forward to considering the progress of related research in the upcoming years.

### QUESTIONS TO THINK ABOUT

- 1. How do 15 year-olds from NZ compare with those from other countries in math and science?
- 2. If you were a parent, would you want your child to attend a school with a higher or lower number of students per teacher?
- 3. Are international test scores good indicators of labour force quality?
- 4. Do better schools lead to more growth?

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Xiang, C, Yeaple, S. R. (2017), "The production of cognitive and non-cognitive human capital in the global economy", unpublished manuscript, conference.nber.org/confer//2017/ ITIf17/Xiang\_Yeaple.pdf

- 10. These countries are: Australia, Canada, Chile, Chinese Taipei, England, Georgia, Hong Kong, Hungary, Ireland, Israel, Italy, Japan, Jordan, Korea, Lebanon, Lithuania, Malta, New Zealand, Norway, Qatar, Russia, Singapore, Slovenia, Sweden, Thailand, Turkey, the United Arab Emirates and the US. PISA reports data for the UK, whereas TIMSS reports only for England. With respect to TIMSS, values for Kuwait do not include private schools, and those for Lithuania do not include students taught in Polish or Russian.
- 11. Concerns have been raised that the tests may be more difficult for students in the developing countries of Latin America and Africa, and thus may not provide reliable information when comparing the variation in countries' performance (Hanushek and Woessmann, 2012). For this reason, Campbell (2018) also considers regional testing in Latin America, which provides an alternative measure of schooling achievements.
- 12. In 2000, James Joseph Heckman shared the Nobel Prize in Economics for his work on the microeconometrics of diversity and heterogeneity and for establishing a sound causal basis for public policy evaluation.

# Politics, profits and books

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> "It is, perhaps, not considered through how many hands a book often passes, before it comes into those of the reader; or what part of the profit each hand must retain, as a motive for transmitting it to the next." From Boswell's Life of Johnson (1791).



Henry Wallis's oil of a shabby Iohnson lunching behind a screen at Edward Cave's office.

Source: telegraph.co.uk/comment/ letters/6189638/A-Samuel-Johnson-novelworth-reading.html, Photo: bridgemanart.com

### GOOD GOVERNANCE, ECONOMIC GROWTH AND DEVELOPMENT

Countries with a higher level of per capita income also tend to perform relatively well in international measures of the quality of government: they are more democratic, less corrupt, and have more political freedom than their poorer neighbours. Although there are some notable exceptions to the general rule, databases such as the World Governance Indicators<sup>1</sup> and the Polity Project<sup>2</sup> indicate that, on average, economic and political development go hand in hand.

This correlation might be because economic development leads to political development: e.g. it could be that higher income helps people to afford a better education, and education helps people to assert their political rights. Or it might be because political development leads to economic development: e.g. the leaders of democratically elected governments might find it more difficult to salt away their country's wealth in Swiss bank accounts, and might find themselves under more pressure to invest in schools and hospitals.

### THE GLORIOUS REVOLUTION

One influential group of economists and political scientists have argued forcefully that the correlation mostly reflects the effect of political development on economic development. Although most of the evidence they look at comes from former colonies of the major European powers (see e.g. Acemoglu et al., 2005), another potential source of evidence is the history of these powers themselves. If we can identify a specific political event in the history of Britain or France that had no immediate economic cause, and if we can find evidence that this event had major

info.worldbank.org/governance/wgi/#home
 systemicpeace.org/polityproject.html

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onsequences, then we can begin to build a case for
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economic consequences, then we can begin to build a case for political change as a catalyst for economic development.

Some economic historians have suggested that one such event happened at the end of the seventeenth century. In 1685, James II succeeded his brother, Charles II, as King of England, Scotland and Ireland. For reasons that had nothing to do with the British economy, James had grown up in France and had converted to Roman Catholicism, never expecting his older brother to die without legitimate children. This made James unpopular in Protestant England: he managed to defeat the first attempt at a coup d'état in 1685 (led by his nephew, James, Duke of Monmouth), but was not so lucky with the second in 1688 (led by his son-in-law, William, Prince of Orange).

History doesn't like losers, so the first, unsuccessful coup is known as "the Monmouth Rebellion", but the second, successful coup is known as "the Glorious Revolution".

In many ways, William was a typical seventeenth-century prince, and not especially fond of democracy. However, the success of his coup relied on the support of the English Parliament. He cut a deal in which Parliament recognised him as king while asserting its own sovereignty and putting explicit limits on royal power. From 1689 onwards, the king had no authority to raise an army, levy taxes or alter laws without the agreement of Parliament.

It has been argued that the British Industrial Revolution had its origins in the constitutional reforms of the Glorious Revolution – with a business-friendly eighteenth-century Parliament now able to guarantee investors' property rights, keep taxes low and eliminate the monopolies that had been created by earlier kings as a reward for loyalty (see e.g. Pincus and Robinson, 2011).

<sup>8</sup> EcoNZ@Otago | ISSUE 41

### ONCE UPON A TIME: PRINTING AND PUBLISHING IN THE 18<sup>TH</sup> CENTURY

In this article, we discuss evidence about the economic impact of the Glorious Revolution on one industry that had a very high profile at the time: printing and publishing.

From the fifteenth century onwards, the printing and publishing industry had been tightly controlled by the Worshipful Company of Stationers, a merchant guild that included publishers, printers and bookbinders. The Company held the copyrights for most of the work of major English writers such as William Shakespeare.

At this time, a copyright was perpetual – it never expired – so it represented a highly valuable piece of intellectual capital, and the re-publication of the work of major writers provided a regular income stream that allowed Company members to take the occasional risk and publish the work of new authors. No-one outside the Company had any such way of mitigating their risk, and so there were no large independent publishers.

In addition, seventeenth-century legislation required all printing presses to be licensed, which in effect meant that printers had to be members of the Company. The Company had the right to search the premises of any press suspected of piracy, and the Company's own court, comprising senior members of the trade, oversaw the regulation of business and ruled on arguments over copyright. In this way, the Company maintained tight control over both book production and the retail market.

The Company's monopoly protected profits but also facilitated censorship of the press: the government only had to deal with a single entity rather than a multitude of independent printers and publishers. The Company was not a friend of freedom of speech, and those campaigning for greater freedom recognised the role that the monopoly played in curtailing both economic and political liberties.

An example of such a campaigner for greater freedom is the poet John Milton, whose *Areopagitica* of 1644 was one of the earliest calls for an end to censorship. The best-known lines in *Areopagitica* celebrate the innovative capacity that Milton attributed to the English nation:

Lords and Commons of England, consider what nation it is whereof ye are, and whereof ye are the governors: a nation not slow and dull, but of a quick, ingenious, and piercing spirit, acute to invent, subtle and sinewy to discourse, not beneath the reach of any point the highest that human capacity can soar to.

However, Milton was also explicit in blaming the Company for its role in stifling this innovative capacity, describing their support for regulation of the press as "the fraud of some old patentees and monopolisers in the trade of book-selling..., men who do not... labour in an honest profession."

After the Glorious Revolution, there was growing support for Milton's point of view in Parliament. Intensive lobbying by Company representatives delayed a change in the law, but in 1710 the legislation that protected their monopoly was finally repealed. Licensing of the press came to an end, and the protection of perpetual copyright was removed from statute law. The Company was given a grace period of 21 years, but copyrights on existing works were scheduled to end in 1731. Copyrights on new works were limited to 14 years.

With 21 years to prepare, the Company's legal team came out fighting in 1731, harassing any new independent publishers who attracted their attention. Although perpetual copyright was no longer part of statute law, Company lawyers argued that it was still

a principle in common law, and they managed to persuade English courts to grant injunctions that prevented independent publication of any books for which the Company held an old copyright.

However, Company lawyers were not so successful in Scotland. Until 1707, England and Scotland had been separate nations with a shared king; tariffs had restricted the cross-border trade in books, and Scottish publishers (who were not members of the Company) had dealt mainly in the Scottish titles for which they held the copyright. The Act of Union in 1707 brought free trade between England and Scotland, but the Scottish legal system was still independent of the English one.

When in the 1740s Scottish publishers began to sell books with expired English copyrights, the Scottish courts were much less sympathetic than the English ones towards the Company lawyers' arguments. After a legal marathon that lasted from 1743 to 1748, the Company abandoned its litigation in Scotland. Through the 1750s and 1760s, Scottish publishers were free to reprint books with expired copyrights, and for over two decades the English and Scottish publishers operated in different regulatory environments.

This inconsistency was eventually resolved in 1774, when, in response to ongoing disputes in the lower courts, the House of Lords considered the case for perpetual copyright as a common law principle. The Lords ruled against perpetual copyright, and England finally acquired the same freedom as Scotland.

### SOME DATA

One way of interpreting the history of the eighteenth-century book trade is to split it into three periods: before the mid-1740s (monopoly in both England and Scotland), from the mid-1740s to 1774 (monopoly in England only; incomplete cross-border arbitrage), and 1774 onwards (competition in both England and Scotland). Some data on the book trade can be interpreted in a way that is consistent with this account.

Figures 1-2, taken from Fielding and Rogers (2017a), plot tenyear moving averages of the total number of editions published in England and Scotland; the numbers come from the British Library's *English Short Title Catalogue* (ESTC) at estc.bl.uk.

It can be seen that until the 1740s, number of editions published in both England and Scotland were relatively low; there was then a rise in Scottish numbers while English numbers remained constant. Finally, in the 1770s, there was a rise in English numbers. In the middle period, the ratio of Scottish publications to English publications was much higher than at the beginning or end of the century.

One explanation for these patterns is that until the mid-1740s there was a monopoly in both England and Scotland, with both English and Scottish publishers restricting production of the works over which they had copyright in order to raise prices. In the middle of the century, the Scottish market became more competitive, but the monopoly still held in England, so Scottish production was relatively high. At the end of the century the English market became competitive too, so English production rose and the original ratio was re-established.

If this interpretation is correct, then the legislative reform initiated by the Glorious Revolution eventually led to a large expansion in the number of books published in Britain. Aside from the direct contribution of the publishing industry to British GDP, this expansion may well have been instrumental in disseminating the innovations that fuelled economic growth at the beginning of the Industrial Revolution.<sup>3</sup> In this case, Pincus and Robinson would be correct in asserting the role of political development in stimulating economic development in early industrial Britain.

Figure 1. Total publications in England and Scotland (ten-year moving averages)



Figure 2. Publications in Scotland as a ratio of publications in England (ten-year moving averages)



### THE 18<sup>TH</sup> CENTURY BOOKSELLER IN THEORY

Fielding and Rogers (2017a) present some statistical tests of the above-mentioned interpretation, but before we look at these tests, we need to look at some economic theory.

The standard way of measuring monopoly power is to calculate the mark-up of price over average cost, usually expressed as a fraction of the cost. In a perfectly competitive market, we would expect the mark-up to be very close to zero, but if the vendor has some monopoly power then she can charge buyers more than the average cost of production. Everything else being equal, a larger mark-up implies more monopoly power.

The "everything else being equal" condition is important: for a given level of market power, changes in market conditions (e.g. changes in the level of demand) will usually change the markup that results from a monopolist's profit-maximising choices. Therefore, if we are interpreting the mark-up as a measure of monopoly power, it will be important to allow for variation in market conditions. This is especially true when the market features an intermediary who buys goods from producers and sells them to consumers, and who controls both the payment to producers and the retail price. Figure 3 illustrates this case, with a monopolistic printer and publisher<sup>4</sup> who sells books to readers for a price of p shillings and acquires the copyrights for manuscripts by paying their authors an amount equivalent to w shillings per copy sold. For simplicity in this example, we will assume that the cost of printing books is zero. The publisher can set both w and p but must ensure that the quantity produced at w equals the quantity consumed at p. This quantity will depend on the shape of the authorial supply curve (S) and of the readers' demand curve (D). The publisher's profits are equal to  $[p - w] \times q$ , and a profit-maximising publisher will try to maximise the size of this area.

In the diagram, the profit-maximising choices are  $p = p_1$  and  $w = w_1$ .<sup>5</sup> This leads to a production level  $q = q_1$ , which is lower than the production level in a perfectly competitive market (*q<sub>PC</sub>*). Readers pay more than the price in perfect competition ( $p_1 > p_{PC}$ ) and authors are paid less than their wage in perfect competition, which is the same as the competitive retail price ( $w_1 < p_{PC}$ ). The mark-up of price over cost is [p - w] / w, or alternatively p/w - 1.

Figure 3. Wages and prices in a market with a bilateral monopoly



What happens when there is an increase in demand (e.g. when the demand curve shifts outwards to D')? As illustrated in the diagram, the new profit-maximising levels of p, w and q are higher than before:  $p_2 > p_1$ ,  $w_2 > w_1$  and  $q_2 > q_1$ . The rise in demand increases the publisher's marginal return from selling books, motivating her to stimulate more production by raising the authorial wage.

What happens to the mark-up? This is not easy to see in the diagram, but, for the reasons explained in Fielding and Rogers (2017a), the mark-up will fall if the supply curve intersects the horizontal axis, i.e. if there are at least some authors who will still write books even if no-one pays them anything. This is plausible if authors have other reasons for writing, e.g. fame, promotion to full professor, the sheer joy of creative expression – or the warm glow from seeing the smiles on the editors' faces when I finally finish this article! In this case, if we see the mark-up rise (or fall), then one explanation is a rise (or fall) in the extent of monopoly power, but another explanation is a reduction (or increase) in demand. Any statistical analysis of mark-up data will need to bear this in mind.

<sup>4.</sup> In reality, the eighteenth-century printers and publishers were normally different people, but, as explained in Fielding and Rogers (2017a), it was the publisher who was making the important pricing decisions. The bookbinders are not really part of the main story, because the books were sold unbound. After you bought a book, you took it to the binder yourself to have it bound however you liked.

<sup>5.</sup> Since the demand and supply curves in the diagram have slopes of 45°, the profit-maximising area is a square

### DATA

The statistical analysis in Fielding and Rogers (2017a) is based on a sample of 430 eighteenth-century books publications. For these publications, the bibliographical record is detailed enough to be able to identify not only the price at which the book retailed, but also the payment to the author for the copyright, along with a range of other characteristics that are known for most books in the record, including: the name of the publisher, the year of publication, the gender of the author, the genre of the work, the number of pages and the book's format.<sup>6</sup> Fielding and Rogers (2017b) includes a discussion of how these additional characteristics in the sample of 430 books compare with those in the population of books listed in bibliographical sources such as the ESTC.

Here is an example of a very famous entry from the dataset:

Author's name:	Adam Smith
Author's gender:	Male
Year of publication	1776
Title:	<i>An Inquiry into the Nature &amp; Causes of the Wealth of Nations</i>
Publisher:	Strahan & Cadell
Sheets:	139
Format:	Quarto
Genre:	Politics & Economics
Author's payment:	6000 shillings
Price per copy:	36 shillings

#### A GLIMPSE OF THE ANALYSIS

Using this information, along with estimates of printing costs and of the number of copies of each book sold,<sup>7</sup> it is possible to measure the change in the average mark-up over the course of the eighteenth century. Then, using a statistical model that controls for the characteristics of individual books, we can measure whether there was any significant change in the mark-up after 1743 (the beginning of the crucial litigation in Scotland) or after 1774 (the date of the House of Lords ruling).

As well as controlling for individual book characteristics, we need to control for time-varying market characteristics: key characteristics include estimates of the underlying level of book demand, measured using estimates of the size and income level of the reading public, and the level of market concentration, measured using ESTC data to calculate the market share of the largest publishers.

As shown in Figure 4,8 there was a downward trend in the average mark-up during the middle of the eighteenth century. However, the large reduction in the mark-up happened before 1774, and the statistical analysis suggests that the main reason for the reduction was a rise in underlying demand, i.e. an outward shift of the demand curve in Figure 3.

Controlling for other factors, we find no significant change in the mark-up after 1743. The point estimate of the change is very close to zero, and using a 5% confidence interval, we can reject the hypothesis that the fall in the mark-up was any greater than 15% of cost, which is a tiny amount compared to the mean and standard deviation illustrated in Figure 4. More strikingly, controlling for other factors, we find a significant *rise* in the markup after 1774: our point estimate of the rise is equivalent to about 50% of cost.

Figure 4. Decade averages of the mark-up of price over average cost as a fraction of the cost



What might explain the rise in the mark-up after 1774? One explanation is that the fall in the ratio of Scottish publications to English publications at the end of the eighteenth century (see Figure 2) represents not an increase in competition among English publishers, but a decrease in competition from Scottish publishers. There is some documentary evidence for such an effect

A noted in Sher (2006, chapter 4), the first half of the eighteenth century saw very little collaboration between English and Scottish publishers: each year saw only a handful of titles published as joint ventures, and English publishers had little taste for business with their Scottish colleagues. This was certainly the case in the 1740s, when the English were litigating in Scotland.

However, the second half of the century saw the development of a "London-Edinburgh publishing axis", spearheaded by the Edinburgh firm of Alexander Kincaid and John Bell and the London firm of Scottish expatriate Andrew Millar. The two firms worked together on a large number of projects, despite the fact that Millar had previously sued Kincaid as part of the English assault on Scottish publishing liberties. Overall, the ratio of joint English-Scottish publications to total publications was over ten times as large at the end of the century as it was at the beginning.

One explanation for the belated enthusiasm for joint ventures is that the failure of the Company to enforce a legal monopoly finally persuaded individual English publishers to co-operate with the Scots and form cross-border cartels to ensure a *de facto* monopoly across Britain. Legal protection from the Scots had never really worked anyway - there were lots of pirated Scottish publications even before the 1740s - and in the end it was better to join them rather than try to beat them. The rise in the mark-up after 1774 reflects the final establishment of an effective English-Scottish cartel.

### ANY CONNECTION?

As shown in Figure 4, the mark-up of price over cost in the publishing industry did fall over the course of the eighteenth century, but our statistical analysis suggests that this trend can be largely attributed to increasing demand and a larger market. Legislative reform had nothing to do with the trend; if anything, the final and definitive end to the legal monopoly spurred the creation of cartels that halted the trend.

There were four main formats: *folio*, in which each page was half the size of the sheet of paper on the printing press, *quarto*, with quarter-size pages, *octavo*, with one-eighth-size pages, and *duodecimo*, with one-twelfth-size pages. For a given number of sheets used to produce the book, the larger formats generally retailed at higher prices. 6.

We need to estimate the number of copies sold in order to work out the authorial payment per copy.

From Fielding and Rogers (2017a).

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

- 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 crosscountry 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?

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

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Source: 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 20th 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-

### **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

### 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 steaming 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).

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 1. 2

And so this and/or and based on the instantion's master's thesis (rader), 2018, which was supervised by the second addrion. The views expressed in this and/or are those of the addrion's, do not necessarily reflect the views of the New Zealand Treasury, where the first author now works. 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). Business cycles are the 'ups and downs' in economic activity.

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 textbased 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



### 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.13

### 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.14

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.

Australia, Brazil, Canada, Chile, China, Europe, France, Germany, India, Ireland, Italy, Japan, Netherlands, Russia, Singapore, South Korea, Spain, Sweden, UK and US. 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. 8.

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?

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   The EPU index is also available for 11 US subcategories, including: (i) monetary

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, (x) 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). 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).

- 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.
  There are also some other studies, outside strict economics, investigating the
- 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.
   There has been a growing interest in the use of social media as a data source
- 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).
- 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).

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# Commentary on the New Zealand economy

### Alan King

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	Mar 2018	Dec 2017	Sep 2017	Sep 2016	Sep 2015
GDP (real, annual growth, %)	2.7	2.9	2.6	4.1	3.6
Consumption (real, annual growth, %)	3.2	4.3	4.3	4.8	3.1
Investment (real, annual growth, %)	5.9	3.2	2.4	4.9	0.6
Persons Employed (full- and part-time, 000s)	2618	2603	2593	2489	2346
Unemployment (% of labour force)	4.4	4.5	4.6	4.9	5.6
Net Migration (year to date)	67,984	70,016	70,986	69,954	61,234
Consumer Price Inflation (annual rate, %)	1.1	1.6	1.9	0.4	0.4
Food Price Inflation (annual rate, %)	0.6	2.3	2.8	-0.2	0.8
Producer Price Inflation (outputs, annual rate, %)	3.5	4.7	5.3	0.1	0.2
Producer Price Inflation (inputs, annual rate, %)	4.2	4.4	4.5	0.1	-0.2
Salary and Wage Rates (annual growth, %)	1.8	1.8	1.8	1.7	1.6
90-day Bank Bill Rate (% p.a.)	1.93	1.88	1.95	2.23	2.85
10-year Govt Bond Rate (% p.a.)	2.89	2.76	2.91	2.40	3.29
2030 Inflation-Indexed Bond Rate (% p.a.)	1.74	1.57	1.88	1.63	2.14
Lending to Households (annual growth, % [1])	5.9	6.0	6.7	8.8	6.5
Real Exchange Rate (end of period [2])	n.a.	71.9	74.6	76.5	68.2
Exports (volume, annual growth, %)	3.7	6.1	-0.2	4.5	6.8
Imports (volume, annual growth, %)	11.1	11.8	3.9	5.2	3.3
Terms of Trade (June 2002 = 1000)	1445	1472	1451	1289	1304
Merchandise Trade Balance (\$m, year to date)	-3,421	-2,850	-2,925	-3,354	-3,169
Visitor Arrivals (annual growth, %)	7.8	6.7	8.6	11.4	8.5
Current Account Balance (% of GDP, year to date)	-2.8	-2.7	-2.5	-2.5	-3.3

[1] Housing and consumer loans made by registered banks and non-bank lending institutions. [2] Trade-weighted index (average value over March 1985-March 2005 = 62.2). Sources: Statistics New Zealand (stats.govt.nz), Reserve Bank of New Zealand (rbnz.govt.nz).

New Zealand's rate of economic growth has been slowing recently. GDP is most likely to coast along at its current rate or slightly slower for the near term, as the contribution of population growth to aggregate demand eases a little, the planned cull of the beef and dairy herds to eradicate *Mycoplasma bovis* constrains agricultural production and the building industry's lack of spare capacity limits further expansion. Economic growth should be strong enough to allow the unemployment rate to continue slowly drifting down for the time being.

The current unemployment rate is the lowest it has been in almost a decade. However, despite almost nine years of economic expansion, the labour market is still not as tight as it was in the years preceding the Global Financial Crisis (GFC). From mid-2004 to mid-2008, the unemployment rate fluctuated between 3.5 and 4%, and the underutilisation rate (which includes part-timers wanting to work more hours and potential jobseekers, as well as the unemployed) averaged 9.5%, as compared with its current value of around 12%.

Part of the reason for this is the significant increase in the supply of labour. In particular, the labour force participation rate – the fraction of working-age people who are either working or seeking employment – has risen significantly over the last decade. This is due to greater participation by men over 65 and women in general.

An implication of this change is that, although per capita GDP is now a modest 8% above its pre-GFC peak, the rise in GDP per worker (a better, though still crude, measure of average productivity across the economy) over the last ten years has been much smaller: a mere 3%.

In comparison, the decade before the GFC (which included the Asian Financial Crisis and the bursting of the Dot-Com bubble) saw GDP per worker rise by over 13% – and the decade before the Asian Financial Crisis, which also included a significant recession, saw an even larger gain. Even more disheartening is the fact that GDP per worker is actually lower now that it was five years ago!

The main reason for this is that the rapid employment growth of recent years – averaging 3.5% per annum since 2013 – has been concentrated in industries with below average levels of GDP per worker. In short, the economy has been creating a lot of jobs, but in general they haven't been particularly productive ones and this has dragged down the average for the economy as a whole.

Nevertheless, when properly measured, NZ's productivity growth rate since 2008 has been quite low at around 1%. Investment in plant, machinery and equipment has been quite strong over the last couple of years, however, and hopefully that will give productivity a boost.