



BANK OF ENGLAND

# Speech

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## A Little More Conversation

## A Little Less Action

Speech given by

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Macroeconomics and Monetary Policy Conference

31 March 2017

The views expressed here are not necessarily those of the Bank of England or the Monetary Policy Committee. I would like to thank Shiv Chowla, Jeremy Franklin, Jonathan Fullwood, Chloe Gilbert, Leanne Leahy, Michael McLeay, Michael McMahon, Sam McPhilemy, Chris Peacock and Paul Robinson for their help in preparing this text. I would like to thank Mike Anson, Tom Belsham, James Benford, Rachel Botsman, Nida Broughton, Kristin Forbes, Keir Haldane, John Lewis, Clare Macallan, Mike Peacock and Eryk Walczak for comments and contributions.

It is a great pleasure to be here at the Federal Reserve Bank of San Francisco conference on “Macroeconomics and Monetary Policy”. I am grateful to my old friend John Williams, President of the San Francisco Fed, for the invitation. And for one night only, John, where better to channel my inner-Elvis.<sup>1</sup>

Back in 2004, Benoit Mandelbrot observed: “So limited is our knowledge that we resort, not to science, but to shamans. We place control of the world’s largest economy in the hands of a few elderly men, the central bankers”.<sup>2</sup> You could quibble with the detail here – a few central bankers these days are women and a few are not old. But the general sentiment is not one which would be entirely out of place today.

It is not difficult to see why. The profile of central banks may never have been higher than today. The responsibilities of central banks may never have been greater than today. And the actions taken by central banks may never have been larger or as far-reaching as today. It is no coincidence that they have recently been described, variously and colourfully, as “masters of the universe” and “the only game in town”.<sup>3</sup>

At the same time, central banks have faced mounting criticism, and some mistrust, of their actions, responsibilities and influence, at least in some quarters. Some have suggested tweaking, perhaps even reversing, central banks’ degree of operational independence over monetary policy.<sup>4</sup> Others have suggested constraining, perhaps even removing, central banks’ degree of discretion over monetary policy.<sup>5</sup>

This story has all the hallmarks of a Charles Dickens novel. Depending on who you follow on Twitter, for central banks it is the best of times and the worst of times; it is an age of wisdom and an age of foolishness; it is an epoch of belief and an epoch of incredulity. A happy ending to this story is by no means assured.

These views may be polarised, perhaps even caricatured. But they matter. Trust is the lifeblood of all things monetary and financial, including central banks. And incredulity is Kryptonite for central banking Supermen (and the odd Superwoman), rendering ineffective their policies and unaccountable their actions. Building trust and legitimacy is among the most pressing issues facing central banks today.

Tonight, I want to explore one avenue for doing so – rethinking how and with whom central banks engage. There has been a revolution in central bank communications over recent years, with much wider and deeper engagement with society.<sup>6</sup> That has been essential in building central bank trust and credibility during good times and protecting central bank legitimacy and independence during bad.

But two recent developments mean that central banks’ engagement strategies may need to be widened and deepened. First, the global financial crisis has dealt a trust-busting blow to many institutions, including

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<sup>1</sup> The title of the Elvis song is, of course, *A Little Less Conversation, A Little More Action (Please)*. Elvis was not a central banker.

<sup>2</sup> Mandelbrot and Hudson (2004).

<sup>3</sup> For example, Sentance (2015) and El-Erian (2015). See also Carney (2016).

<sup>4</sup> In a recent CFM-CEPR survey of Europe-based macroeconomists, only 45% disagreed with the statement that “central bank independence in the Eurozone and the UK will decline over the next 48 months” (den Haan *et al*, 2017).

<sup>5</sup> See House Bill 3189 (2015).

<sup>6</sup> See Warsh (2014) and Blinder *et al* (2017).

central banks. Second, the way trust is built has been fundamentally reconfigured. Where once trust was anonymised, institutionalised and centralised, today it is increasingly personalised, socialised and distributed.

Facing these new constraints, the challenge for central banks is to rebuild trust among a wider set of societal stakeholders, more distrustful and diffuse than ever previously, using a set of trust-building technologies, less well-understood than those used previously. As they have through their history, central banks will need to adapt their customs and practices to these new social norms and technological possibilities.<sup>7</sup>

This is a big agenda. It is not one remotely unique to central banks. And it is not one I could remotely do justice to tonight. Nonetheless, given the policy weight these days being placed on central banks' shoulders, and the changing social and technological landscape facing them, it is probably as good a time as any to begin exploring these new frontiers of central bank engagement.

Those new frontiers include communicating in simpler, narrative language that engages a wider audience using localised, personalised messaging; finding new ways to engage with cohorts of society currently out of reach, listening as often as talking; and using new technologies – nudging and polling, naming and gaming – to better understand the views and behaviours of wider society. For central banks, this is a brave new world.

## **The Rising Tide of Central Banking**

Let me start by looking backwards. The 20<sup>th</sup> century may yet be seen by monetary historians as the one when central banking came of age. At its start, there were fewer than 20 recognisably “central banks” operating globally (Chart 1). Their responsibilities were typically heavily circumscribed by custom and practice, by law or by the state. In the Bank of England's case, it was all three.

In these early days, the role of central banks was often to act as an operational arm of government: buying and selling foreign exchange to preserve a currency peg; distributing central bank liquidity to financial institutions, in normal and crisis times; serving as banker to the government and to commercial banks; and issuing banknotes to the public to serve as the ultimate medium of exchange.<sup>8</sup>

As the 20<sup>th</sup> century unfolded, central bank numbers swelled. By its mid-point, they had risen more than twofold, to around 60. By its end, they had risen a further threefold to not far off 200. Today, there are roughly as many central banks as there are countries in the world.

Some of this ascent was simply the arithmetic consequence of a rising number of independent nation states. But that is not the whole story. The fraction of nation states with a central bank rose from around

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<sup>7</sup> My friend and former colleague Minouche Shafik recently made many of these points in her final speech as Deputy Governor (Shafik, 2017).

<sup>8</sup> Capie *et al* (1994).

one-quarter at the start of the 20<sup>th</sup> century to close to one by its end. In other words, during the course of the 20<sup>th</sup> century central banks came to be seen as an essential building block of the nation state.<sup>9</sup>

Accompanying this rise in the number of central banks through the 20<sup>th</sup> century was a rise, albeit not a straight line rise, in their stock of responsibilities. Prominent among these was responsibility for setting monetary policy. Latterly, this has gone by the name central bank operational “independence”.

Even the word “independence” needs careful interpretation. As international practice has shown, there are various shades of independence, depending on who sets the objectives and instruments of monetary policy and how policy decision-makers are appointed and held to account. Indeed, there is now a small cottage industry measuring these various dimensions of central bank independence.<sup>10</sup>

Nevertheless, on most metrics central bank independence in the setting of monetary policy has risen secularly and sharply over the past few decades. Until the 1980s, the number of recognisably “independent” central banks was relatively modest. On one often-used measure, as recently as 1981 there were still fewer than 50 independent central banks globally.<sup>11</sup>

In the period since, the fraction of central banks with operational independence in the setting of monetary policy has sky-rocketed, rising from around a half in the 1980s to around 85% today (Chart 2). In a generation, operational independence has gone from nice-to-have to have-to-have. It has become an international norm, a statement of best institutional practice.

This rising tide of responsibilities is not confined to monetary policy. Around 80% of central banks have some role in setting new *macro-prudential* tools.<sup>12</sup> The Bank of England is among the over 50% of central banks fully in charge of doing so. In the US, responsibility is shared across agencies, including the Fed. In the European Union, responsibility is also spread across agencies, including a number of central banks.

In the run-up to the financial crisis, *micro-prudential* policy was increasingly located outside central banks. Since the crisis, however, that trend has reversed (Chart 3). The ECB has assumed responsibility for supervising the euro area’s largest banks. The Federal Reserve’s supervisory responsibilities have been expanded and enhanced. And in the UK, micro-prudential supervision has returned to the Bank.<sup>13</sup> The most recent chapter in central banks’ evolutionary history has been increased openness and transparency about their actions, monetary, macro- and micro-prudential. This shift was a natural

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<sup>9</sup> Consistent with that, the historical evidence suggests that institutions, such as central banks, are essential elements of statecraft (Acemoglu and Robinson, 2012).

<sup>10</sup> See for example, Cukierman *et al* (1992), Grilli *et al* (1991), Crowe and Meade (2007), Amone *et al* (2006), Dincer and Eichengreen (2014), Bodea and Hicks (2015) and Garriga (2016).

<sup>11</sup> The Cukierman *et al* (1992) index, updated and expanded by Garriga (2016).

<sup>12</sup> Claessens *et al* (2016), discussed in Blinder *et al* (2017).

<sup>13</sup> While monetary and financial stability *policies* are often seen as the fulcrum of central banks, they do not fully define their *responsibilities*. A survey by the Bank of International Settlements identified a further 16 responsibilities undertaken by at least some central banks (BIS, 2009).

accompaniment to increased central bank responsibilities and autonomy. With increased delegated powers came increased societal responsibilities to explain how those powers were being discharged.

This shift in transparency practices took time. In 1981, Karl Brunner was still speaking about the “mystique” of central banking.<sup>14</sup> In the early 1990s, “mystique” was still the one-word advice offered by one prominent central bank governor (Paul Volcker) to another (Mervyn King).<sup>15</sup> For most of their history, opacity has been deeply ingrained in central banks’ psyche. And for much the greater part of its history, the Bank of England was at the forefront of that opacity agenda.

For its first three centuries, the Bank appears to have kept its public utterances to a minimum. It was effectively mute. The prevailing ethos was well-captured by the job description provided to the official who became, in effect, the Bank’s first press officer: “keep the Bank out of the press and the press out of the Bank”.<sup>16</sup> The Bank was good to its word.

During the period 1920 to 1945, the Bank’s communications strategy was far from expansive. The Governor gave precisely one speech a year - the annual Mansion House lecture (Chart 4). This tended not to be rich in content. Nor was it not ideally suited to enhancing wider public understanding, being delivered to an audience of around 300 City bankers and merchants, several glasses of wine into the evening.

Body language can sometimes substitute for the spoken word. So it was at the Bank of England. In the 1920s, the Governor’s “eyebrows” famously became one of the Bank’s means of communicating. The eyebrows were, in a way, a primitive form of emoji: sterling crisis – sad face. Nonetheless, for even the most malleable-faced Governor, the “eyebrows” were an imperfect communications medium.

Beginning in the 1960s, there was a sea-change in central bank communication practices. Speeches by the Governor and his deputies increased, by the 1960s averaging around five per year. They were matched by other communication innovations. December 1960 saw the first edition of the Bank of England *Quarterly Bulletin*. There was roughly a doubling in the number of speeches in each subsequent decade.

In 1992, a formal target for inflation was announced in the UK, together with a regular schedule of monthly monetary policy meetings. In 1993, the Bank began publishing a quarterly *Inflation Report*, setting out its views on the economic outlook. In 1996, the *Inflation Report* gained a sister publication, the six-monthly *Financial Stability Review*. With the arrival of the nine-person Monetary Policy Committee (MPC) in 1997, the number of published speeches increased further from around 13 per year in the nineties to around 34 in the noughties. Accompanying these speeches were published minutes of MPC meetings.

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<sup>14</sup> See Brunner (1981) and Goodfriend (1986).

<sup>15</sup> As described by King (2000).

<sup>16</sup> Capie (2010).

In 2013, the Bank began issuing so-called “forward guidance” on its policy actions.<sup>17</sup> In 2014, following a review by David Stockton, the Bank began publishing forecasts for a wider set of variables.<sup>18</sup> And from 2015, following a review by Kevin Warsh, the Bank agreed to publish full transcripts of MPC policy meetings (Table 1).<sup>19</sup>

These publications do not capture the entirety of the Bank’s engagement strategy. In 2016 alone, the Bank appeared before Parliament on 22 separate occasions. Senior Bank officials made around 60 visits to the Bank’s regional agencies across the UK. Bank officials visited nearly 5,000 companies and charities. The Bank ran a schools competition, involving over 250 schools. And it hosted a Future Forum, at which it engaged openly with a broad cross-section of the public on a wide range of issues.

These step changes in transparency have been broadly mirrored across a range of other central banks. Notable milestones among the world’s major central banks have included: in 1994, the Fed’s decision to announce immediately its target interest rate after each meeting; the announcement of different forms of forward guidance, starting in Japan in 1999; publishing minutes of policy meetings, most recently introduced by the ECB in 2015; and forecasts for interest rates, which the Fed has done since 2012 (Table 1).

The major central banks’ engagement strategies have been equally as impressive. For example, the Federal Reserve has a long-standing and extensive commitment to promote community development at the national, regional and local levels. That includes working with communities whose residents are low- and moderate-income. The various initiatives of the Community Development team at the San Francisco Fed are excellent examples of this work.<sup>20</sup>

The Federal Reserve has also sought to learn from listening to the views of those same communities. In 2015, the Federal Reserve Board formed a new Community Advisory Council, which contains a diverse group of 15 citizen representatives. It meets with the Fed Board twice a year to provide information and recommendations on policy matters, with a focus on issues relevant to low- and moderate-income residents.

Bringing this together, it is possible to construct weighted-average aggregate transparency indices. These show a steady ratchet-up in openness across a range of central banks over time (Chart 5). And if we look at mentions of the world’s major central banks in the main newspapers, these have also been on a steadily-rising trend over time (Charts 6A and 6B).

What a difference a century makes. A century ago, the Bank issued one speech a year. In 2016 alone, it issued 80 speeches, 62 working papers, close to 200 consultation documents, just under 100 blogs and over 100 statistical releases - in total, over 600 publications. That is around 9,000 pages or around four and a

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<sup>17</sup> Monetary Policy Committee (2013).

<sup>18</sup> Stockton (2012), McKeown and Paterson (2014).

<sup>19</sup> Warsh (2014), Bank of England (2014).

<sup>20</sup> See Williams (2016a) for a discussion of one of these initiatives.

half million words. It would not be over-egging this pudding to call this a genuine revolution in central bank transparency. And this revolution has taken place, in central bank terms, at warp speed.

## The Benefits of Central Bank Communication

In lockstep with this evolution-cum-revolution in central bank transparency practices has emerged an academic literature seeking to understand, explain and assess the implications of this shift. This literature has been growing fast. Chart 7 plots the percentage of mentions of the words “central bank” followed by “communication” in English-language publications over the past 70 years.<sup>21</sup> It shows an exponential increase.

This literature provides a useful starting point for assessing the progress made so far by central banks in boosting their openness, the advantages this may have conferred and where future transparency efforts might best be directed. In theory, transparent communications confer two high-level benefits.<sup>22</sup>

First, improved central bank communications can help stabilise the economy. They do so by improving outside agents’ information on the likely course of the economy (now and in the future) and/or on the likely course of policy (now and in the future). This reduces the degree of uncertainty felt by households and firms, better enabling them to make decisions about spending, saving, working and the like.

Improved information about the economy or economic policy may also have an effect on expectations. For example, information on the target or instrument paths for monetary policy might help shape inflation expectations. In this way, transparency initiatives can also help improve the effectiveness of economic policy.<sup>23</sup> These are the *ex-ante* benefits of communications arising from improved *understanding*.

Second, transparent communications improve the ability of outside agents to assess the performance of the central bank and hold them to account. They fulfil a democratic demand for accountability.<sup>24</sup> They also increase incentives for the delegated party to make wise decisions in the first place, knowing they will be held to account.<sup>25</sup> These are the *ex-post* benefits of central bank communications arising from improved *trust*.

These conceptual benefits, improved understanding and trust, are fairly well-understood, if not uncontroversial.<sup>26</sup> Over the course of the past couple of decades, a body of empirical evidence has built up to

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<sup>21</sup> Drawing on the methodology from Hansen and McMahon (2016).

<sup>22</sup> For example, Blinder *et al* (2008), Reis (2013).

<sup>23</sup> For example, Crowe (2010), Eusepi and Preston (2010) and Hubert (2015).

<sup>24</sup> Briault *et al* (1997), among others, make this point.

<sup>25</sup> See the survey by Geraats (2002).

<sup>26</sup> Morris and Shin (2002) argue that noisy central bank communication can worsen the understanding of monetary policy, if they cause expectations to coordinate away from fundamentals. Kool *et al* (2011) show how even precise communication could worsen outcomes, if it leads the private sector to reduce investment in information.

assess some – but only some – of these benefits. Let me set out some of the key lessons from that literature, before identifying places where the existing evidence base is sparse.

The richest seam of research has focussed on whether and how central bank communications have affected financial markets, often using event-studies around the time of key announcements. This has concluded, perhaps unsurprisingly, that central bank announcements cause significant movements in asset prices.<sup>27</sup> For example, they cause adjustments along the yield curve, in equity and corporate bond prices, in the exchange rate and in the volatility of these asset prices.

This suggests central bank announcements are a significant source of information to financial markets, either about the course of the economy or the course of policy or both. That is despite often sharp differences in communication strategies across central banks.<sup>28</sup> It is difficult to say, definitively, whether these strategies have improved the efficiency with which asset markets function, given that fundamentals are unobservable. But that is not an unreasonable conjecture.

A second strand has assessed how central bank communications affect professional forecasters. The evidence suggests they have a good understanding of how monetary policy behaves.<sup>29</sup> Central bank communications have been crucial to that understanding. For example, this improved after the Fed began giving press conferences in 2011.<sup>30</sup> And central bank communications have been found to contain information that can help predict future policy decisions.<sup>31</sup>

A related literature has looked at the impact of monetary frameworks and communications strategies in shaping inflation expectations and in influencing inflation dynamics. Generally speaking, this points towards the announcement of formal inflation targets having helped anchor the inflation expectations of financial market participants, companies and consumers around these targets.<sup>32</sup>

A third strand has looked at the role of the media in intermediating central bank messages. Studies have examined the factors that influence how the media intermediate central bank messages.<sup>33</sup> There is mixed evidence on how well the media performs this task. There is evidence the media leads to a better understanding of the ECB's monetary policy.<sup>34</sup> But in the US and Germany, there is evidence the media may sometimes impair communication and bias opinion.<sup>35</sup>

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<sup>27</sup> For example, Gürkaynak *et al* (2005), Hendry and Madeley (2010), Rinaldo and Rossi (2010) and Hayo *et al* (2010).

<sup>28</sup> Ehrmann and Fratzscher (2007).

<sup>29</sup> Carvalho and Nechio (2014).

<sup>30</sup> Dräger *et al* (2016).

<sup>31</sup> Sturm and de Haan (2009).

<sup>32</sup> For example, Joyce *et al* (2010) and Gürkaynak *et al* (2010).

<sup>33</sup> Berger *et al* (2011) find that press reports of ECB decisions are more critical when the decision is a surprise, or when made under a backdrop of high inflation. The reception is more positive when press conferences are informative or if the ECB president has recently been active in giving statements.

<sup>34</sup> For example, van der Cruijssen *et al* (2015).

<sup>35</sup> See Dräger *et al* (2016) for the US and Lamla and Lein (2014) for Germany.

As the number of central bank publications has expanded, a new strand of research has begun analysing the words and phrases used by central banks, using semantic-modelling and other text-mining techniques.<sup>36</sup> For example, these methods can be used to extract from written central bank material the key themes and issues that have been the focus of central bank deliberations and communications.

Academics Stephen Hansen and Michael McMahon have used semantic techniques to identify particular monetary policy topics. These can be used to quantify how much emphasis an issue has had in committee deliberations. For example, Charts 8A and 8B focus on the topic of the “labour market” in the MPC’s minutes. They suggest the fraction of time spent discussing this topic picked up in 2013, the year that the MPC issued forward guidance linked to the unemployment rate.<sup>37</sup>

Charts 9A and 9B do the same for the FOMC’s deliberations, focussing on groups of words from FOMC transcripts related to “recession”. With individual FOMC transcripts, we can also track how much time each individual FOMC member devoted to this topic, shown in the range. The median FOMC member started talking more about recessions at the point the US downturn took hold, although there was a significant variation in the time different FOMC members devoted to this topic.

Taking this literature together, it suggests the great strides forward in central bank transparency over recent years have delivered some significant stabilisation benefits, most notably for financial markets, inflation expectations, macro-economic forecasts and, to some degree, media reporting. So what the missing links when assessing the potential benefits of central bank communications? Three stand out.

First, the vast majority of studies have focussed on the *ex-ante* informational benefits of central bank transparency. There is far less evidence assessing whether openness initiatives have affected central bank legitimacy – the *ex-post* accountability benefits. In other words, empirical evidence has focussed on the role of central bank transparency in fostering *understanding* rather than *trust*.

Second, studies have focussed on the impact of central bank communications on the key information intermediaries – Markets (M), Economists (E) and News (N) – rather than the general public. Empirical studies of central banks have been dominated by MEN. This is a notable gap. It is the general public who, ultimately, make decisions about spending and saving in the economy. And it is the public who decide, ultimately, whether central banks are serving society well or poorly.<sup>38</sup>

Third, when it comes to assessing the impact of central bank actions on the trust and understanding of the public, little if any attention has been paid to some of the richer informational channels through which news

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<sup>36</sup> See Bholat *et al* (2015) for a summary of these methods.

<sup>37</sup> Ongoing work by Hansen, McMahon and Tong uses these techniques to analyse the Bank’s *Inflation Report* and finds that its text moves financial markets, even after controlling for the *Report*’s quantitative aspects. This suggests that the narrative explaining what drove the forecasts and how the committee interprets the data matters, not just the numerical forecasts.

<sup>38</sup> For example, Blinder *et al* (2008) suggest that “Virtually all the research to date has focused on central bank communication with the financial markets. It may be time to pay some attention to communication with the general public...In the end, it is the general public that gives central banks their democratic legitimacy, and hence their independence.”

might spread between people. For example, the recent work of George Akerlof and Robert Shiller has emphasised the role of “popular narratives” in shaping the public’s expectations and decisions.<sup>39</sup>

Story-telling is the ultimate communications device. History is no more than a sequence of stories. These stories spread word by word, mail by mail, Tweet by Tweet. They obey the same laws of motion as epidemics, with viral spread beyond a tipping point. And in a world of modern media, these popular narrative epidemics are probably spreading further and faster than ever previously. This matters for individuals’ feelings and decisions and, potentially, for macro-economic behaviour.

Pessimistic popular narratives have been used to explain the sharp contraction of spending at the time of the Great Depression and the Great Recession.<sup>40</sup> With popular narratives more virulent than in the past, tracking their source and spread may be increasingly important for understanding the economy. This poses risks to policymakers. But it also presents opportunities if they are able to shape and shepherd these narratives through adroit communications.

### **Understanding and Trusting Central Banks**

Even if the empirical literature is sparse, the great leaps forward in central bank openness over recent years would be expected to have earned them a transparency dividend among the harder-to-reach general public. That dividend might take the form of improved *trust* in central banks by the public and an improved *understanding* of their functioning. There is disappointingly little evidence of either.

Trust in institutions generally has taken a body-blow over the past few years. The Edelman global survey suggests that public trust in businesses, government, NGOs and the media has fallen sharply. In 2016, only around half of the general public trusted these bodies. In the UK, fewer than 30% of the population trusted these institutions in the latest survey, down from over 40% a few years ago (Chart 10).

The source of dwindling trust is itself revealing. It reflects a widening gap between trust in institutions among the elites (which has held firm) and among the general public (where it has fallen). This trust gap between elites and the general public averages 15 percentage points globally, having been around 9 percentage points as recently as 2012. In the UK and US, this gap is around 20 percentage points.<sup>41</sup>

What is true of institutions appears to be true too of the economics profession. A recent poll by YouGov in the UK asked the general public how much they trusted various professions.<sup>42</sup> Economists were towards the bottom of this list, well below scientists, historians, weather forecasters and even sports commentators

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<sup>39</sup> Akerlof and Shiller (2009), Shiller (2017).

<sup>40</sup> Shiller (2017).

<sup>41</sup> Elsewhere, I have called this widening trust gap the Great Divide (Haldane, 2016).

<sup>42</sup> YouGov (2016).

(Chart 11). There is always someone worse off than you – in this case it was politicians – but the overall picture is discouraging.

If trust in institutions is low, and if trust in economists is low, the backdrop is not propitious for institutions containing (lots of) economists. So it is with central banks. Chart 12 shows some measures of trust or confidence in the four major central banks over the past decade. In the UK, the US and the euro area, trust has fallen over that period, often coincident with the global financial crisis. The Bank of Japan has been an exception, although its financial crisis came rather earlier.

If we turn from trust to understanding, the picture is similar. In 1997, Robert Shiller conducted a survey of public attitudes towards inflation. He concluded then: “there will probably always be a communications gap between economists and the public. But there appears to be rather more of a gap than most of us would have expected”.<sup>43</sup> In the period since, there is little evidence this gap has closed.

A survey by the BBC in 2011 asked the public about the meaning of the words “inflation” and “GDP”, the two central concepts in modern-day macroeconomics. Only 16% of the general public could clearly define what was meant by inflation, while only 10% could do so for GDP.<sup>44</sup> For central banks, whose stock-in-trade is inflation and GDP control, these fractions are disappointingly low.

In 2013, Paola Sapienza and Luigi Zingales conducted a survey of economic experts and the general public on a set of economic policy questions.<sup>45</sup> Not only were there large differences between experts and the public in their answers. Tellingly, these differences were largest in those areas where experts were most in agreement. Expert economic opinion increased the general public’s sense of scepticism. That gap between elites and the general public is, if anything, even larger when it comes to economic issues.

Turning to central banks, it is a good news/bad news story. In surveys, around 60% of the general public believe the Bank of England has a good understanding of the economy. This is the good news. The bad news is that only around a quarter believe it explains its actions and decisions in terms they can understand.<sup>46</sup> On monetary policy, around half of the general public do not know who sets interest rates. Almost a half have either never heard of the MPC or think it is part of government.

Let me give a specific policy example to illustrate this (lack of) understanding. In the summer of 2013, the MPC provided guidance about the future path of monetary policy. This guidance was aimed explicitly at reducing uncertainty among households and companies, with simple and clear language about the future path of policy. It was accompanied by a communications plan focussed on the general public, including TV interviews and a published document.

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<sup>43</sup> Shiller (1997).

<sup>44</sup> Quoted in Thompson (2016).

<sup>45</sup> Sapienza and Zingales (2013).

<sup>46</sup> See Haldane (2016).

The Bank conducted a survey after the guidance had been issued, with the aim of assessing its impact on the general public. This painted a mixed picture. The Bank's message got through to around 75% of companies, but only around one-fifth of households. Moreover, even among those households who heard the guidance, as many felt less confident as more confident about the economy (Table 2).

In the US and the euro area, surveys have found a similar lack of understanding of central bank actions. They have also identified where these understanding problems are most acute. In the US, survey respondents with lower incomes or without a college degree are less likely to understand monetary policy.<sup>47</sup> In the euro area, a Dutch survey found respondents with higher education or income were more likely to answer questions about the ECB's monetary policy correctly.<sup>48</sup>

This is a puzzle. Despite a huge increase in the volume of central bank reporting, neither understanding of, nor trust in, central banks has improved. These trust and understanding problems are not unique to central banks – they are common across banks, business, government, the media. Nonetheless, what explains these trends? The financial crisis and the slow recovery from it are likely to have been one factor, but not the whole story. Let me highlight three other factors to have played a role, for central banks and more broadly.

(a) *The changing nature of trust*

Trust has been studied extensively by philosophers, sociologists and anthropologists over many years.<sup>49</sup> These studies have shown that trust can take a variety of forms and can change shape quite fundamentally over time. Such a mini-metamorphosis appears to have taken place over recent years, in particular among trust in institutions.<sup>50</sup>

The traditional model of trust was a fairly simple one. To a significant degree, it was anonymous, centralised and institutional. The actions of institutions, like the Fed and the Bank, were trusted by the general public, even when few of them understood what it is these institutions did and why. And having a trusted third-party, able to exercise a degree of control over monetary and financial affairs, was a source of comfort.

This institutional structure, in the main, served society well. Not least, it lasted for several hundreds of years. Some have argued that a good chunk of society's success over this period can be attributed to these institutional foundations.<sup>51</sup> Latterly, however, there are signs these foundations have started to subside. And institutions are being challenged, at least in part, because a different model is emerging in which trust is distributed rather than centralised, social rather than institutional, personal rather than anonymous.

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<sup>47</sup> Carvalho and Nechio (2014), using the University of Michigan Survey of Consumers.

<sup>48</sup> van der Cruysen *et al* (2015).

<sup>49</sup> For example, Govier (1997), Barber (1983) and Lissberg *et al* (2015).

<sup>50</sup> For example, the work of Rachel Botsman.

<sup>51</sup> Acemoglu and Robinson (2012).

One example of that trend concerns a commodity many thousands of years old and one close to central banks' hearts – money. Money, certainly fiat money, relies for its existence on trust. In many countries over many centuries, this trust was delivered in a centralised, institutionalised and, to a large degree, anonymised way, namely through central banks.

Latterly, there are just the faintest signs that could be changing. The Blockchain or Distributed Ledger Technology (DLT) first came to prominence through Bitcoin, the crypto-currency. Since then, the range of applications of DLT has expanded massively, well beyond crypto-currencies. What differentiates DLT from earlier technologies is the ability to confer trust on a commodity or transaction without the need for a central institution for verification. Trust is distributed, personalised, socialised.

It is too soon to tell whether DLT will revolutionise financial services in general and money in particular. But its potential has not escaped the notice of central banks or the financial services industry. Both are exploring DLT as a means of reconfiguring financial infrastructures. And some believe this new technology of distributed trust could bring about a genuine transformation of money and finance.

One reason to think this possible is because a similar model of distributed trust has already fundamentally reshaped a number of other products, services and businesses. We have seen the rapid emergence of businesses built on peer-to-peer interactions and transactions. These business models are underpinned by trust between buyer and seller, producer and consumer, trust which is distributed and personalised.

Take the market for accommodation. This has been transformed by the emergence of AirBnB. This peer-to-peer or distributed model of accommodation among strangers is underpinned by feedback ratings which endow participants with personalised trust. AirBnB is only 9 years old but already has over three million listings. Its estimated valuation is well above the market capitalisation of established, centralised, hotel chains such as the Hilton and Hyatt.

Or consider travel. Everyone has heard of Uber – itself a distributed trust model. Fewer people have heard of BlaBlaCar. This is a distributed model of riding-sharing among strangers, also underpinned by feedback ratings and personalised trust. BlaBlaCar is only 11 years old but already transports more than four million people per month, well above Eurostar or JetBlue airlines.<sup>52</sup>

(b) *The changing nature of media*

Accompanying, and contributing, to these shifts in the structure of trust have been important changes in the methods by which information is intermediated. The traditional model of information intermediation gave the mainstream media – TV, newspapers, radio – a central role in filtering, assimilating and propagating

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<sup>52</sup> Botsman (2016).

information to the public. As recently as 2000, circulation of paid-for daily and Sunday newspapers was equivalent to around 60% of US and UK households.<sup>53</sup>

The past few years have seen dramatic shifts in the way news is reaching the public. Some of this may reflect a decline in trust in mainstream media. A recent Gallup poll reported trust in the mass media had fallen to less than a third of the US population.<sup>54</sup> This compares with more than half at the start of the century. This decline in trust has been particularly pronounced among younger age groups.

This loss of trust in mainstream media can also be seen in surveys of how people receive their news. Only 20% of Americans get news regularly from a print newspaper.<sup>55</sup> For those aged over 50, the traditional media continue to dominate as a news source (Chart 13). But for those under-50, around half get their news online and fewer than 10% from newspapers.

Within online, social media has been rising rapidly as a news source. A recent Reuters Institute study in the UK found that more than half of all 18-24 year olds used social media as a news source and more than a quarter used this as their main news source, for the first time more than TV.<sup>56</sup> These fractions are similar in the US. Among young adults, social has usurped mainstream media.

In some respects, this shift in media methods is the mirror-image of changes in the nature of trust-building. As trust-building has become distributed, personalised and socialised, so too have media methods for conveying information and news. This is likely to have been a two-way process, with technology shaping trust and trust technology. Meanwhile, centralised sources of news have seen trust wane and with it usage.

Online and social media often, of course, get their information from mainstream media. This, it could be argued, makes these shifts in media channels less important than might first appear. But looks can be deceiving. As Canadian philosopher and writer Marshall McLuhan first told us over 50 years ago, the medium often is the message.

For online and social media, information from mainstream sources is often being filtered and purified, sometimes using search algorithms. These tailor the content to an individual's tastes and preferences. Quite literally, this is news and information personified. It makes for news and narratives which tend to be self-reinforcing and self-referential. The echoes in this chamber are louder, reach further, last longer.

These new media channels make, then, for a different process of news transmission. Social networks mean it is likely to propagate faster and further. They mean popular narratives are likely to emerge and spread

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<sup>53</sup> Communic@tions Management Inc (2013).

<sup>54</sup> Gallup (2016).

<sup>55</sup> Pew Research Center (2016).

<sup>56</sup> Reuters Institute for Journalism (2016). See also Shafik (2017).

faster and further in a self-reinforcing fashion. They make for larger, louder, hermetically-sealed echo chambers. And that is true whether this is old news, new news or fake news.

(c) *The changing nature of language*

Operating alongside these seismic shifts in the nature of media and trust have been equally-large shifts in the public language. As Mark Thompson discusses in his recent book, public language has become shorter, sharper and shriller, with higher impact and wider reach, aided and abetted by new media.<sup>57</sup> Twitter, as a media medium, ticks every one of these boxes: personalised, socialised, distributed, short, sharp and shrill.

‘Twas not ever thus. Once upon a time, when trust in institutions was high, complex language posed no trust problem. Little was published, even less read. Public discourse was infrequent and attentive audiences were narrow. Complex language added to the “mystique” of institutions, including central banks, and as a sign of technical competence. As Stella Artois was reassuringly expensive, central banks were reassuringly inexpensive.

Today, the situation is different. Trust in institutions has been eroded despite a great deal more being published, including by central banks. Complex language is these days more likely to breed mistrust than mystique. Expert opinion has become a source of scepticism rather than reassurance. The well-directed Tweet has displaced the well-argued speech, the Facebook “like” the approving newspaper review, the smiley-faced emoji the hand-written thank-you note.<sup>58</sup>

That change in the nature of public language – shorter, simpler, shriller - puts an even greater premium on institutions making themselves understood, despite (indeed, because) of the technocratic task with which they are charged. That means speaking in words and sentences that land rather than levitate with the public, that connect rather than divide public opinion, that illuminate rather than darken public debate.

So how well do central banks fare on that front? Earlier this year, the Campaign for Plain English, a militant band of grammarians, turned its attention to the Bank of England MPC’s Monetary Policy Statement. This statement is intended to be a simplified and sanitised account of the MPC’s judgements. The Campaign for Plain English described it as “worthless, impenetrable waffle” and “gobbledygook”. Reading between the lines, I am not sure they liked it.

These views are instructive, but subjective. More objective measures have been developed, however, that enable us to measure the linguistic complexity of written and spoken material. For example, some of the more widely-used of these metrics are based on word and sentence length, the use of different word types etc.<sup>59</sup> These metrics can be applied to central bank publications. The picture they paint is a sobering one.

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<sup>57</sup> Thompson (2016).

<sup>58</sup> The irony of making these points in a long speech is not lost on me.

<sup>59</sup> DuBay (2004).

For example, Chart 14 takes a set of regular Bank of England publications (MPC minutes, MPC statements, excerpts from the quarterly *Inflation Report*, Governors' speeches) and assesses their linguistic complexity over time. It uses one well-known measure of linguistic complexity, the Flesch-Kincaid reading grade score.<sup>60</sup> These central bank publications are compared with a set of external publications (broadsheet and tabloid newspapers, the Economist magazine and political speeches).

Bank of England publications have an average reading grade score of around 14 – that is to say, they would be expected to be understood, on average, by someone aged around 20. They have been steady around this level for a number of years. In linguistic complexity terms, that puts them around 2 years ahead of broadsheet newspapers, 4 years ahead of tabloid newspapers and around 6 years ahead of the average political speech. They are around 5 years ahead of the average Dickens novel.

We can do the same exercise for a selection of Federal Reserve publications (FOMC minutes, speeches by the Chair, Beige Book summaries) and compare those with some external publications (the New York Times, Washington Post and Financial Times and US political speeches). Chart 15 suggests Fed publications tend to have a higher reading grade score than Bank of England ones. For example, FOMC minutes have a reading grade score of around 17, compared to around 14-15 for MPC minutes.

Nonetheless, in common with the Bank, there is a material reading grade gap between central bank and external publications, of around 5 years with mainstream newspapers, 8 years for political speeches generally and 13 years for election campaign speeches by President Trump. They are 11 years ahead of the average Elvis song. If we look at a selection of other central banks' English language publications, we see the same pattern. Reading scores are around 14, well above the levels of external publications (Chart 16).

Taken at face value these scores are interesting, if perhaps not altogether surprising. After all, central banks occupy a technocratic space with its own technical language. Nonetheless, it is worth reflecting on the costs at which this complexity comes. For example, what fraction of the general public are central bank publications excluding because of their language? Given data on the distribution of literacy rates across the population, linguistic complexity metrics allow an estimate of that fraction.

Using data from the US national adult literacy survey, we can estimate the penetration rate of various publications, central bank and external (Chart 17).<sup>61</sup> This suggests that a campaign speech by President Trump is accessible to around 70% of the US adult population, an Elvis song around 60%, political speeches a little less than half and the mainstream US press when discussing monetary policy around 20%. Beige Book summaries reach fewer than 10% of the US adult population. FOMC minutes are accessible to only around 2%.

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<sup>60</sup> Kincaid *et al* (1975). The precise algorithm used will have some bearing on the final Flesch-Kincaid score that is computed for a given text. Other metrics of linguistic complexity yield broadly similar results.

<sup>61</sup> Kirsch *et al* (1993).

According to OECD studies, levels of literacy in the UK and US are not greatly dissimilar.<sup>62</sup> Assuming the same literacy rate in the UK and US implies that political speeches are accessible to slightly less than half the population, Dickens novels to around 40% and newspapers to around 30%. Bank of England publications are accessible to less than 10% of the adult population.

These fractions are low. Around 95% of the general public are likely to find central bank publications inaccessible. Perhaps unsurprisingly, these tend to be the same segments of society with least trust and understanding of central banks – for example, the young and less well-off. Mainstream media can help mediate, but they have an increasingly constrained reach among those same cohorts.

Herein lies central banks' challenge: a rising tide of central bank communications on the one hand, a retreating tide of public trust and understanding on the other. Conventional means of communicating are unlikely to be able to reach those parts of society for whom mistrust and misunderstanding are most acute. To reach that wider audience, to close those trust and understanding deficits, central banks will need new tools and techniques.

### **A New Frontier for Central Bank Engagement**

Which tools and techniques? Were this simply a case of producing more, trust and understanding problems would have been long since solved. It is not. As philosopher Onora O'Neill has argued, simply adding to reporting does little for accountability and trust-building.<sup>63</sup> If reports are mostly unread or unreadable, smothering people in more words and numbers could even detract from trust and accountability.

In one sense, this is not a new point. Claude Shannon, the grandfather of information theory, did not define information by words or digits. Instead he defined it by whether *uncertainty* was reduced on the part of the receiver.<sup>64</sup> If receivers are overwhelmed by the depth, discouraged by the density and bamboozled by the complexity, reporting can be *disinformation* on Shannon's criterion. For a chunk of society, the very volume of reporting may be increasing uncertainty and impairing information, understanding and trust.

Even the term "central bank communication" – a mainstay of central banking and a centrepiece of academic studies of central banks – may fail as a description of what is these days required to build trust and improve understanding. The quest to improve communications makes sense. But it has more than a hint of better sermons to the assembled congregation, enhanced education of an inattentive audience, a smoothly-swinging one-way door. Communication means mouths.

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<sup>62</sup> See Binkley (1997).

<sup>63</sup> O'Neill (2002, 2014).

<sup>64</sup> Shannon (1948).

These days, building trust and improving understanding may require a different approach. It may be less about communication than conversation, less about edicts than engagement, ideally on as personalised and localised a basis as possible. It may involve listening as much as speaking, understanding of the public as much as public understanding, a two-way door. Conversation means ears as much as mouths.

What new tools and techniques might help achieve this wider engagement? Let me offer a few ideas, ranging from the workaday to the speculative. Even more than usual, the speculative ideas are not the views of the Bank of England or its policy committees.

### **(a) Different Strokes for Different Folks**

Many macro-economists are brought up learning the representative agent model, as a simplified way of making sense of aggregate behaviour. When it comes to central bank engagement, thinking in these terms is unhelpful. The public are anything but monolithic in their abilities and appetites. They are different folks.

This suggests that, as a first step in any programme of improved central bank engagement, an improved understanding of these different folks is needed: their concerns, their constraints, their degrees of understanding and distrust, their appetite for information and their preferred means of receiving it. Knowing your audience is public relations 101. Yet it is one lesson central bank publications may, historically, have failed fully to heed. If so, it is relatively easily rectified.

Having identified the different folks, it is then a question of applying different strokes to communicating and engaging with them. One size will not fit all. That probably means the need for engagement policies that are targeted and layered to meet the different needs of different cohorts.

This does not mean we should stop communicating with our current audience. Their needs may be well-served by some of the analysis we already produce. But it may call for a particular focus on those cohorts currently out of reach of central banks, such as the young and the less well-off.

Both the message and the medium matter here. For the wider public, especially the younger and the less well-off cohorts, Mark Thompson's synopsis of the changing form of public language – shorter and simpler – may be a good starting point. Over the past year or so, the Bank of England has diversified its stable of publications, with a view to reaching that some of that wider audience.

In 2015 the Bank began a staff blog, "Bank Underground". This was intended to be shorter, simpler and somewhat more opinionated than anything the Bank had previously published. So far, the blogs have received over 700,000 hits. The most popular are amongst the best-read of any Bank publication. That is probably helped by their shorter length (under 1500 words) and greater reach (reading grade scores of 9 mean that they are accessible to up to 30% of the population).

The Bank introduced last year “Knowledge Bank”. This is largely intended as an educational device, covering how the economy works and how central bank policies may be affecting it. It contains cartoons and videos as well as prose. It is targeted, explicitly, at younger age cohorts. Its reading score of 8 means it is capable of reaching almost half of the UK adult population.

The Bank, in common with many other central banks, is making greater use of social media. As a two-way personalised, socialised, distributed communications medium, with high penetration among the young, it has real attractions. The Bank has a Twitter account with over 200,000 followers. Individuals do not have Twitter accounts and nor does the Bank have a cohort of Bloggers and Vloggers providing daily diaries of time spent at the central bank coalface. But it is early days.

These are examples of layered and targeted content, the like of which a number of other central banks, including the Federal Reserve System, are investing. The Bank’s existing publications are now more flexible and layered in their length and content, potentially making them accessible to a wider audience (Chart 18). But this is clearly just the start. I shall resist the temptation to say it is going to be great.

## **(b) Minding your Language**

The changing nature of public language means central banks will need to adapt their own language to increase its penetration and reach with the general public. There are two elements to this – the technical and the behavioural. The first is easier to fix.

By technical I mean the complexity of the language used – the length and complexity of words, sentences and paragraphs. Currently, central banks score poorly technically, in part because they are themselves technicians. This comes at a cost in terms of accessibility. Fortunately, there is a large literature, and a sizable cohort of grammarians, who have considered how to shape language to improve its reach.

For example, like many others I suffer from an acute case of hippopotomonstrosesquipeadaliophobia – that is to say, the fear of long words. And if you choked on that last sentence, so now might you. Simple words can make a dramatic difference to readability. “Inflation and employment” leaves the majority of the public cold. “Prices and jobs” warms them up. “Annuity” deep freezes the public, whereas “investment” thaws.<sup>65</sup>

In general, the readability of text is improved the larger the number of nouns and verbs and the fewer the adverbs and adjectives.<sup>66</sup> This old mantra remains true in the Facebook age: Facebook posts are more likely to be shared the more frequent nouns and verbs and the less frequent adverbs and adjectives. The ratio of nouns and verbs to adverbs and adjectives in an Elvis song is 3.3. In my speeches it is 2.7.

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<sup>65</sup> Smart (2016).

<sup>66</sup> In their classic *Elements of Style* (1979), William Strunk and E B White write: “Write with nouns and verbs, not with adjectives and adverbs. The adjective hasn’t been built that can pull a weak or inaccurate noun out of a tight place.”

The behavioural dimension to public language involves speaking in ways which best connect the receiver with the sender. Behavioural science has given us plenty of insights into how to do that.<sup>67</sup> Messages wrapped in real-world *narratives* are more likely to stick than those wrapped in numbers. Messages which are *personalised* are more likely to stick than those that are anonymous. And messages that are *local* are more likely to stick than those that are national.

These maxims have been borne out in real-world experiments. Personalising and localising messages has been found to increase their reach, and their chances of being acted on, in a wide variety of public policy settings: in everything from encouraging tax payments to discouraging carbon emissions; from encouraging school attendance to discouraging crime; from encouraging charitable giving to discouraging sugar consumption. Linguistic “nudges” appear to work.<sup>68</sup>

Yet localised and personalised messages often flow less easily from the mouths of central banks. For understandable reasons, they have tended to have a national rather than local focus, to weigh the objective over the emotional, to be fact rather than anecdote-based. That is all well and good. But it does carry a cost. It is hard to engage with a building. The view from 30,000 feet can feel a little distant. Excel spreadsheets do not emote. This can inhibit building trust and improving understanding.

Localising the message can certainly help. Here, the work of the regional Feds in the US and the Bank’s regional agents in the UK is crucial. More generally, analysis of the regional and distributional split is important for understanding the economy and localising messages about how it is performing.<sup>69</sup> Even though monetary policy acts nationally, and central bank tools may be ill-equipped to redress regional or distributional differences, that is no excuse for central banks not monitoring and understanding, continuously and in depth, the fortunes of different regions, sectors and cohorts of society.

Localising also makes it easier to convey information as connected stories rather than as disconnected data. During 2016, I wrote a number of speeches on the economy, probably totalling over 50,000 words. From that mass of words, the best-remembered single sentence, by far, did not concern my views on GDP or Brexit or QE. It was not a number, a theory or even a chart. It was anecdote drawn from a visit I made to a set of charities in Nottingham at which they told me there had, for them, been no recovery. That stuck. Personal stories stick. No amount of data is ever as adhesive.

Personalising events also helps stickiness. In 2015, the UK’s Meteorological Office began naming its storms. Just before Christmas, “Storm Barbara” hit the UK, causing widespread devastation to as many as a dozen umbrellas and blowing off several people’s hats. Yet advance warnings of Storm Barbara inspired

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<sup>67</sup> See Kahneman (2011) and Shiller (2017) for examples.

<sup>68</sup> See Thaler and Sunstein (2008), Adams and Hunt (2013) and Halpern (2015).

<sup>69</sup> For example, Haldane (2016).

81,000 tweets and 4,000 retweets. Polling by YouGov suggests that, since storms began being named, more than half of people have begun taking steps to prepare themselves.

Storm-naming in the UK follows long-standing US practice of naming (very much more) extreme weather events. This began back in 1953. The evidence is that naming these events has increased significantly public awareness. Even the names matter. The death toll from female-named hurricanes in the US is higher than for male-named ones, even once storm-severity is taken into account.<sup>70</sup> Had “Storm Barbara” been “Storm Brian”, several items of apparel may have been alive today.

I am not suggesting central banks should start following this meteorological precedent to the letter. I am not sure naming the next sharp downturn in activity “Recession Andy” (much less “Depression Andrea” given the meteorologists experience with female names) would necessarily raise public awareness greatly. Nonetheless, making the impact of economic events on people’s lives as specific and personal as possible can help raise public awareness, understanding and preparation.

Earlier this year, one of the major UK supermarkets withdrew from its shelves Marmite, a popular yeast-based spread that has the appearance, viscosity (and, for some, taste) of the bitumen spread on British roads. The situation arose because the supplier had increased significantly the product’s price in the light of sterling’s depreciation last year. Remarkably, “Marmitegate” led the news for much of the day it broke.

In the event, tragedy was averted when the supermarket and supplier reached agreement and the great British public were allowed to continue tarring their toast. This high-profile event did, however, quite helpfully put on the general public’s radar the likelihood of prices in the shops beginning to rise in the period ahead. It was information with narrative content and personal touch. Arguably, “Marmitegate” raised public awareness of rising inflation much more effectively than any amount of central bank jawboning. Stories, like Marmite itself, stick.

### **(c) Public Understanding, Understanding the Public**

Many central banks have made big strides towards improving public understanding of the economy and their policies over recent years. Many have an active schools programme, websites with educational resources, issue leaflets, posters, podcasts and videos. Some have a Museum. These are all great.

But central banks, like many institutions, have sometimes been better at talking than listening. Or, put differently, they have done better at public understanding than understanding the public. As a personal trust-building device, it may be a good time to rebalance these scales, to start abiding by a “one mouth, two ears” policy - a time, if you like, for a little more conversation and a little less action.

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<sup>70</sup> Jung *et al* (2014).

Some of this is likely to involve central banks engaging on an on-going basis with a different, and more eclectic, set of partners than in the past. For example, this year the Bank is looking to increase its engagement with state schools outside of London and the South East, who might otherwise not have had any contact with the Bank or anyone else in the public policy domain. I personally have been increasing my engagement with these schools for the past four years.

Recently, the Bank's regional Agents have begun increasing their engagement with charities, social enterprises, faith groups and trades unions, among others, listening to their often very different perspectives on how the economy is faring. This is something the Governor and I have prioritised over a number of years. These events are similar in spirit to the Community Advisory Council run by the Federal Reserve. Personally, I find they provide an incredibly useful window on the world, one which has shaped my view on policy.

In a world of popular narratives, where emotions shape decisions and where stories can snowball, aggregates measures of activity may do a less good job of capturing the forces shaping people's decisions. The qualitative, the conversational, the narrative, the emotional are the new data in this new world – optimism and anxieties about tomorrow, as much as income and jobs today. Harvesting these new data calls for a different set of approaches and reaching new communities in new ways.<sup>71</sup>

One example of that is making greater use of surveys of sentiment. The Bank of England recently set up a new survey of companies to assess their degree of uncertainty around Brexit and what impact this was having on their decision-making. It is as much a survey of sentiment and perceptions as investment intentions. This follows previous analysis undertaken by Nick Bloom and Steven Davis in collaboration with the Atlanta Fed.<sup>72</sup>

Working with psychologists, the Bank has undertaken research to capture sentiment in financial markets, applying semantic-analytic techniques to the words used by market participants.<sup>73</sup> More generally, the same semantic techniques used to study central bankers' words could be applied to the words used by the general public to capture their topics of conversation, their sentiment and their popular narratives on the economy.

Clearly, there is further to go. As a baby step, later this year I am starting a series of "Townhall" meetings around the UK, partnering with organisations such as the Muslim Council of Britain, Age UK, Citizens UK and the Royal National Institute of Blind People (RNIB). Their purpose is to listen and learn, as much as talk and teach, to local communities about the issues that matter for them. These public events, like public language itself, need to be localised and personalised if they are to land.

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<sup>71</sup> An excellent recent example of this is contained in Carol Graham's new book on the well-being of different cohorts of American society (Graham, 2017).

<sup>72</sup> Federal Reserve Bank of Atlanta Decision Maker Survey (2017).

<sup>73</sup> Nyman *et al* (2016).

#### **(d) Nudging and Gaming**

There are new techniques and technologies becoming available that may help central banks to improve the potency and reach of their messages and the quality and quantity of the feedback they receive on them. These techniques allow a much wider reach at a much lower cost. They also enable a dynamic process of two-way learning between central banks and the general public to take place.

Semantic analysis has been a blossoming area of research over recent years, including on central bank text. But, at least insofar as research on central banks is concerned, this analysis has largely been positive and descriptive – what *have* central banks been communicating? An alternative would be to apply these same techniques on a normative and prescriptive basis – how *should* central banks be communicating to best engage with a wider audience?

For some time, this has been an area of active study and policy design by behavioural economists. For example, in the UK the Behavioural Insights Unit (BIU), initially set up by the UK government, has worked on a range of public policy questions, including taxation, regulation and consumer choice. In particular, their work has focussed on how sometimes subtle changes in language can be used to improve understanding by the public and to “nudge” them towards a particular course of action.<sup>74</sup>

Understanding the response of the public is often not easy and often calls for the use of randomised control trials familiar from development economics. For example, the Financial Conduct Authority in the UK has recently used these techniques to explore how changes in the language used to describe financial products affects the likelihood of them being understood and purchased by retail investors. In choosing retirement income products, use of the word “annuity” shrunk take-up by 25%.<sup>75</sup>

This approach of trialling, eliciting feedback and then adapting is not common in macro-economic public policy. That is, at least in part, for the understandable reason that doing experiments with the general public on a macro scale is a rather daunting task. For reasons of credibility, central banks often feel they need to convey a strong sense of certainty about the impact of their words and actions.

My own sense is that this needs to change. Experimentation and trialling, adaptation and learning are likely to be crucial when dealing with central banks’ new, wider audience: more diffuse than ever in their actions and reactions, increasingly silo-ed and self-reinforcing in their behaviours, shaped by social norms and popular narratives that propagate faster than ever. The response of this complex, adaptive social system to central bank interventions is likely, often, to be unknown.

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<sup>74</sup> For example, Halpern (2016).

<sup>75</sup> Consumers in the trial were presented with hypothetical choices. See Smart (2016) for details.

Experimental trials, which solicit and respond to feedback, are one way of reducing somewhat that uncertainty through learning and adaptation. These are used extensively by companies when trialling new games, new films and new apps, among other things. Although the bar is higher, and the trial would need careful stage-management, there is no reason these experimental methods could not be used to trial new communications and policies by central banks.

A more sophisticated, and dynamic, approach to eliciting feedback is by “gamifying” the policy problem. A number of central banks and government departments have already made steps in this direction. The San Francisco Fed has a game called “Chair the Fed”. This is not a campaign rally by John. It is a game that gives people the chance to set monetary policy to steer the US economy. In the UK, “MyUK” allows people to put themselves in the Prime Minister’s hot-seat and invoke Article 50 on any day of the week.

These are effectively single-person games, designed largely for educational purposes. But there is no reason a similar game could not be designed which was multi-person. This would allow interactions among the public, in their communications and choices, to take place. This is crucial for understanding the propagation of stories, and the contagion in choices, across the economy. Once those are captured, the game could offer important insights into public actions and reactions to central bank interventions, in an experimental setting.

There are many existing games that are multi-player and interactive, many of them hugely successful. A small sample would include Second Life, Minecraft, EVE Online and World of Warcraft. A number of these games contain elements of the economy or financial system, albeit in a simplified form. Creating a game with a realistic economy, realistic psychology and realistic policy would not be a venture into the unknown.

Robert Shiller has spoken of the role played by “narrative entrepreneurs” in catalysing and shaping the popular narratives that propagate across society. Central banks are narrative entrepreneurs, shaping views on the economy and on policy through their words, providing a hopefully benevolent “nudge” to expectations. In a world of new media, that narrative entrepreneurial role has probably never been more important.

But judging, ex-ante, the likely success of these central bank narratives is very difficult. And the premium on getting this right is much greater when the fortunes of the whole economy are at stake. Will a message be understood? By whom? How will it propagate through new media? How will it shape emotions - optimism, anxiety, exuberance, depression? And how, ultimately, will it affect choices – savings, spending, working?

Answering these questions in an increasingly complex, adaptive, connected system like the economy is one of the greatest challenges in public policy. Our existing modelling infrastructure – simplified, objective, static – is probably ill-equipped for the task. An interactive, multi-person game may sometimes be a better test-bed for new communications and policies, without first inflicting them on the real-world.

The use of gaming technology may also help central banks reach cohorts of society which they have traditionally found difficult – the Facebook generation. Globally, around half of young adults aged 18-24 play games online. It might be time for central banks to start playing them at their own game.

Is this fanciful? 114 years ago, almost to the day, Elizabeth Magie entered a Patent Office in Washington DC to file a patent for a game called “The Landlord’s Game”. On the same day, the Wright Brothers filed a patent for the first aircraft. “The Landlord’s Game” was a brilliant property-based board game which, like other games at the time, had a higher public policy purpose: to educate adults and children on the perils of rising income inequality and wealth concentration. The game was a modest success.

In 1935, Charles Darrow sold an adapted version of the game to Parker Brothers under the name “Monopoly”. This was a huge success. It has gone on to sell hundreds of millions of copies worldwide, earning Darrow and Parker Brothers millions of dollars in royalties. Magie earned \$500 for selling her patent. While the Wright Brothers’ patent will forever be etched in the history books, Magie’s has largely been lost.

If nothing else, this episode shows that games can play an important role in public understanding and perhaps even in public policy. Monopoly remains as popular today as it was in the latter half of the 20<sup>th</sup> century. Were it virtual rather than physical, its multi-players measured in millions rather than fingers, its money from an interactive central banker rather than an inanimate piggy-banker, if people swapped stories as well as properties, perhaps this game could help address the 21<sup>st</sup> century’s problems too.

### **(e) Rules and Referenda**

It has been suggested by some that rules should play a more central role in the setting of monetary policy.<sup>76</sup> There are a number of possible motivations for doing so. One is that it makes the policy process simpler and more transparent. Machine would, in effect, replace man (and the odd woman). Other things equal, this greater transparency would tend to increase the degree of accountability of, and trust in, the central bank among the general public.

But other things are rarely equal. The downsides of slavish adherence to a fixed rule are also well-understood.<sup>77</sup> They include the fact that rules can sometimes be fragile and fallible, particularly at times of structural change. If blind adherence to an algorithm sent policy and the economy into a tailspin, that is unlikely to enhance trust in central banks among the wider public. That does not mean, of course, that rules cannot play a useful informational role in setting policy, as is the case in a number of central banks.<sup>78</sup>

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<sup>76</sup> Meltzer (2009), Taylor (2011, 2012).

<sup>77</sup> Williams (2015, 2016b), Haldane and Radia (2016), Yellen (2017).

<sup>78</sup> Williams (2014), Yellen (2017).

An alternative way of making monetary policy more accountable would be to canvass the views of the general public directly.<sup>79</sup> Digital technology means this option is feasible. But would it be desirable? Public referenda are hardly infallible. You may have heard there was an important referendum in the UK last year. The result came as a surprise to many. For some, it was a shameful example of the perils of populism. Contrary to some claims, the outcome was a travesty for democracy and at odds with the will of the people.

The referendum in question was initiated by the National Environmental Research Council (NERC) and involved a public ballot to choose a name for the new polar Royal Research Ship. Various options were mooted as suitable candidates, including “Sir David Attenborough” (the famous British naturalist), “Henry Worsley” (the famous British explorer) and “Pingu” (the famous cartoon penguin).

The winner of the public ballot was none of these. With almost 80% of the popular vote, “Boaty McBoatface” romped home courtesy of a social media campaign. At that point, NERC jettisoned the will of the people. The ship was named instead “Sir David Attenborough” - though, in a small concession to democracy, its remotely operated sub-sea vehicle was named Boaty McBoatface. This is an object lesson in the perils of public polling for policy purposes. Sometimes, there is madness in crowds.<sup>80</sup>

That is not to say, however, that public opinion is always and everywhere mad. In his book *Superforecasting*, Philip Tetlock uses evidence drawn from a variety of experimental studies to determine the ingredients of a good forecast.<sup>81</sup> He finds that the key lies in diverse perspectives, drawn from amateurs as well as experts. Often, he finds, there is wisdom in crowds. If harnessed, the wisdom of crowds and of amateurs can improve the forecasting performance of experts.

Regularly canvassing the views of the public, on the economy and on the setting of monetary policy, would be one way of harnessing that wisdom. This would allow central banks to listen to a potentially much wider and richer array of views on the setting of policy, in particular from those who might otherwise be distant, disenfranchised or distrustful of central banks and their actions. It would open central banks’ ears (and eyebrows) to a wider range of societal stakeholders when setting policy.

The information provided from the public could serve as another input to the policy-setting process, much as monetary policy rules (and other data) do today. What are the public telling us about the right setting of policy and why? Clearly, neither rules nor polls should be followed slavishly - the scope for misinformation and mishap is simply too great. And the whole purpose of delegating policy to an independent third-party is to avoid the short-termism that may sometimes affect the general public.

Nonetheless, if crowds, like rules, sometimes contain wisdom – different perspectives, different views, different narratives – then harvesting this information could be an important additional input into the policy

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<sup>79</sup> Earle *et al* (2016).

<sup>80</sup> Mackay (1841).

<sup>81</sup> Tetlock and Gardner (2016).

process. It would help reach, and solicit direct feedback from, those parts of society otherwise out of central banks' reach. And it may, as a by-product, also improve public understanding of policy and the economy.

Embracing the views and expertise of citizens is increasingly common in other disciplines. "Citizen Science" draws on the time and expertise of the general public to solve problems as diverse as spotting star and galaxy formations and forecasting the weather.<sup>82</sup> As well as helping solve these problems, Citizen Science increases public interest and understanding of science. What better time for central banks to begin enlisting the help of some Citizen Economists.

## Conclusion

Central bank communications have come a long way. When pressed by a Parliamentary Committee in 1930 to explain the Bank's actions, Montagu Norman replied: "Reasons, Mr Chairman? I don't have reasons, I have instincts". The Bank's Chief Economist of the day was given similarly short shrift by Norman: "You are not here to tell us what to do" he scolded "but to explain why we have done it." How things change.

Central banks are public institutions, put on earth to serve the public. As the public's norms, preferences and demands shift, so too must central bank practices. That is exactly what has happened over many years.

The evolution-cum-revolution in central bank communications practices over recent years came in response to new circumstances and new responsibilities. It has delivered significant benefits.

But the past few years have seen further societal and technological shifts, at a time when central banks having been bearing a heavier policy load than ever previously. As trust and technology has changed, so too must central banks. Their latest metamorphosis needs to ensure they reach the parts of society they previously have not reached, using media they have not previously used, conversing as much as convincing, listening as often as talking.

It is an irony, and not one lost on me, that this speech is a classic example of one-way central bank communications. Worse still, it comes in at around 11,500 words, contains 2,000 adverbs and adjectives and has a reading grade score of around 11. Perhaps central bankers, like this one, have always been better at preaching than practicing. If so, that needs to change. And when better to change than now.

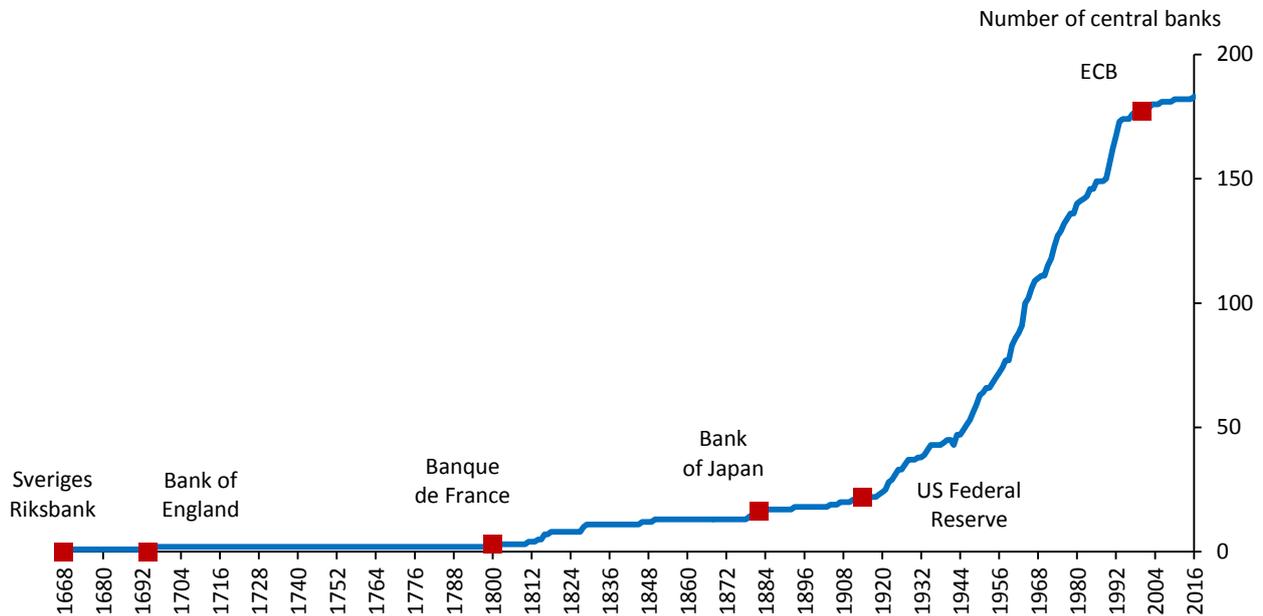
This would be a brave new world for central banks. They do not need to be as magical as Mandelbrot's shaman, as good a storyteller as Charles Dickens, as great a showman as Elvis. But to make a success of this new world, central banks will need to be brave.

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<sup>82</sup> Roy *et al* (2012).

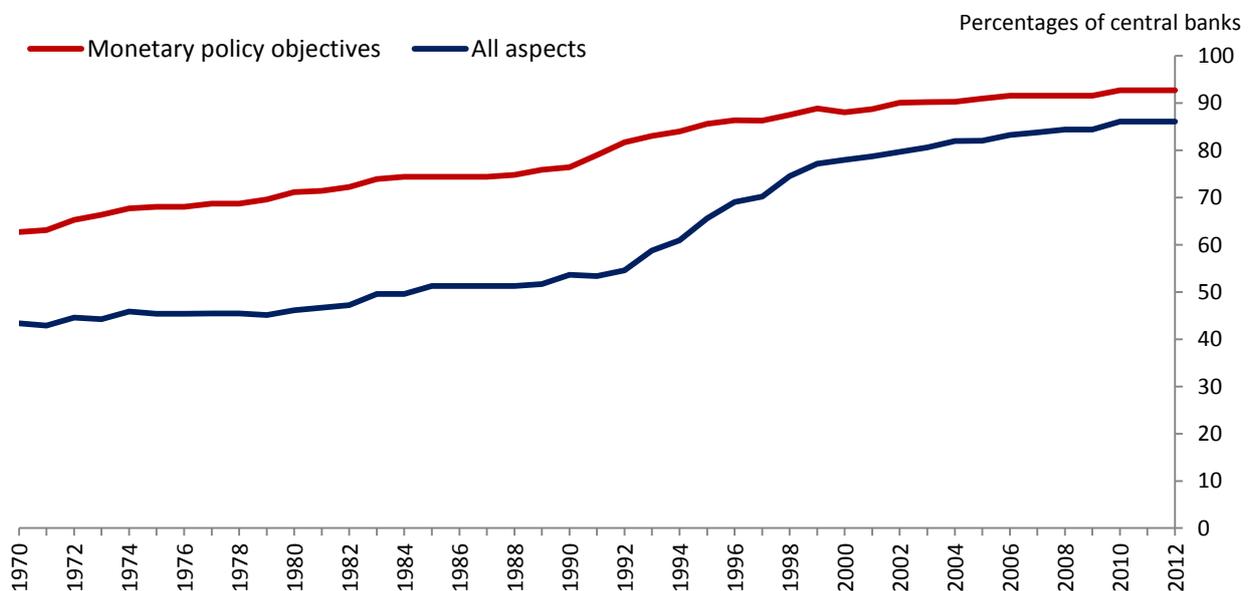
## Annex

**Chart 1: Number of central banks**



Source: Central Banking Directory

**Chart 2: Percentage of independent central banks**



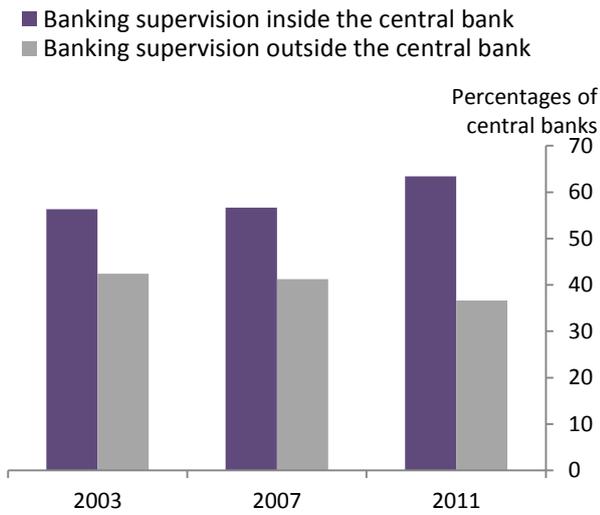
Source: Garriga (2016) using index of Cukierman *et al* (1992).

Notes: Central banks with values greater or equal to 0.4 on the index are defined as independent. 'Monetary policy objectives' measures whether the central bank's objective is focused on price stability. 'All aspects' also includes variables related to the appointment of the CEO/Governor; policy formulation; and limitations on lending to the government.

**Chart 3: Percentage of central banks with**

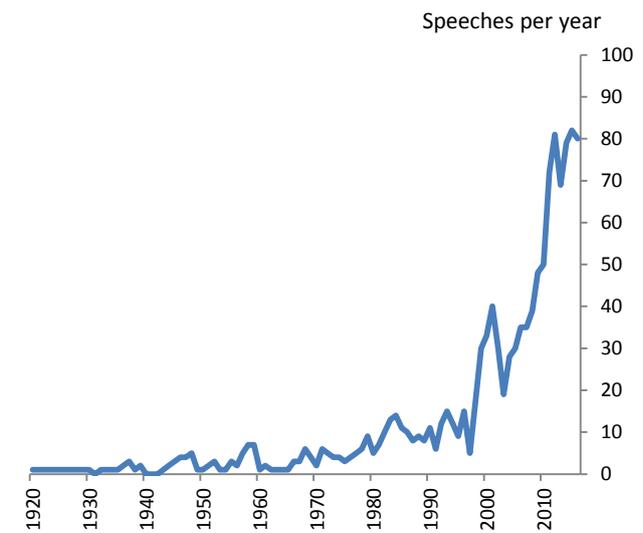
**Chart 4: Governors' and other policymakers'**

### responsibility for bank supervision



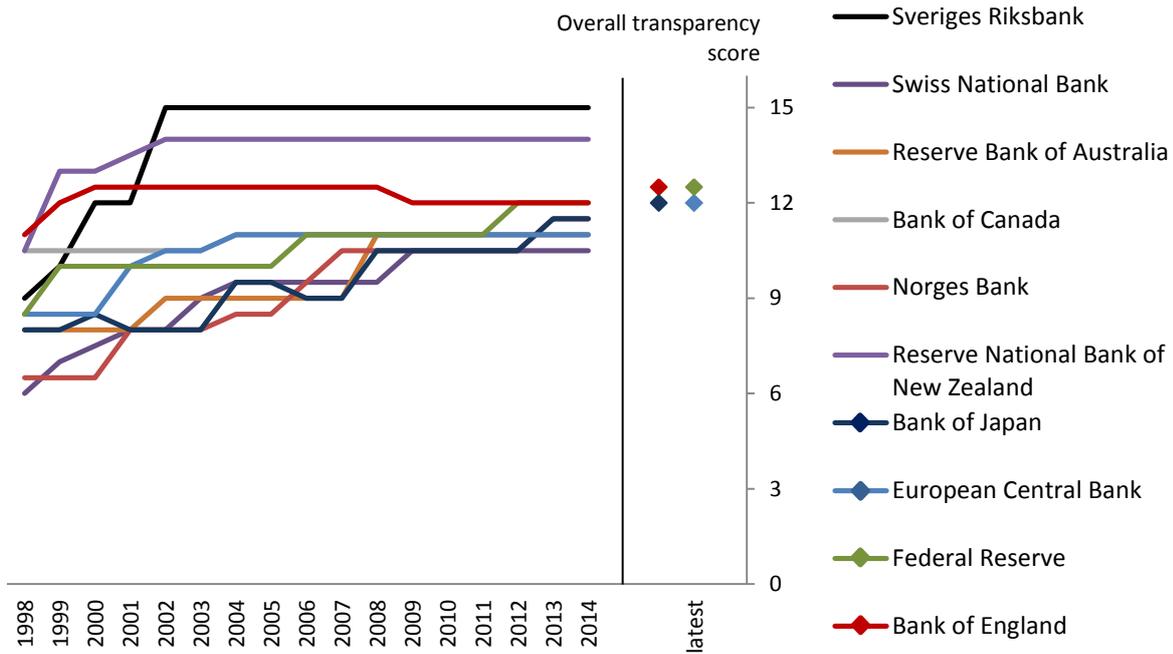
Sources: Bank Regulation and Supervision Surveys: World Bank (2003, 2007, 2011).

### speeches



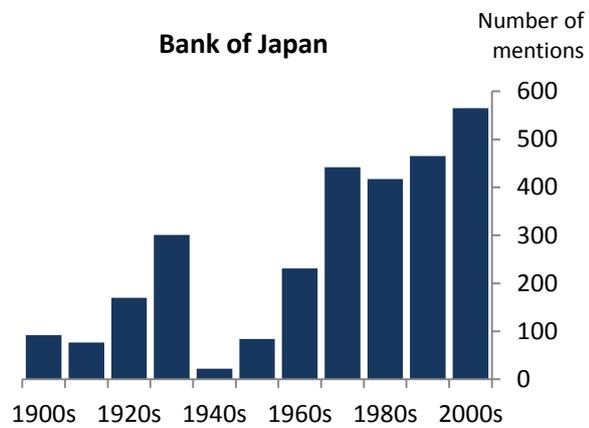
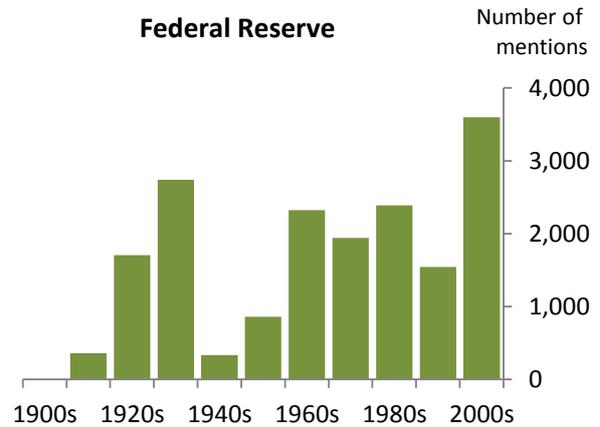
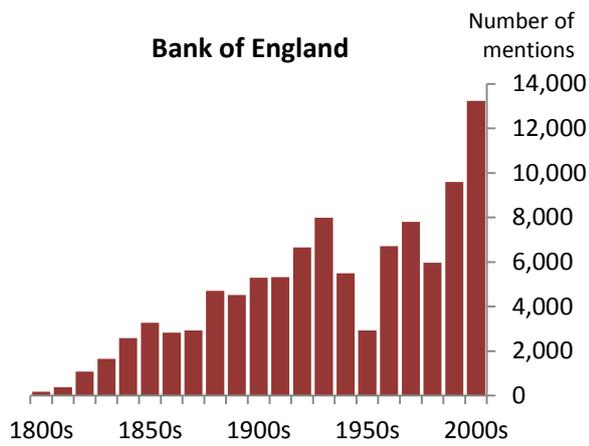
Source: Bank of England.

### Chart 5: Central bank transparency indices



Sources: Dincer and Eichengreen (2015) for data up to 2014, Bank of England calculations based on the index of Eijffinger and Geraats (2006) for latest datapoint.

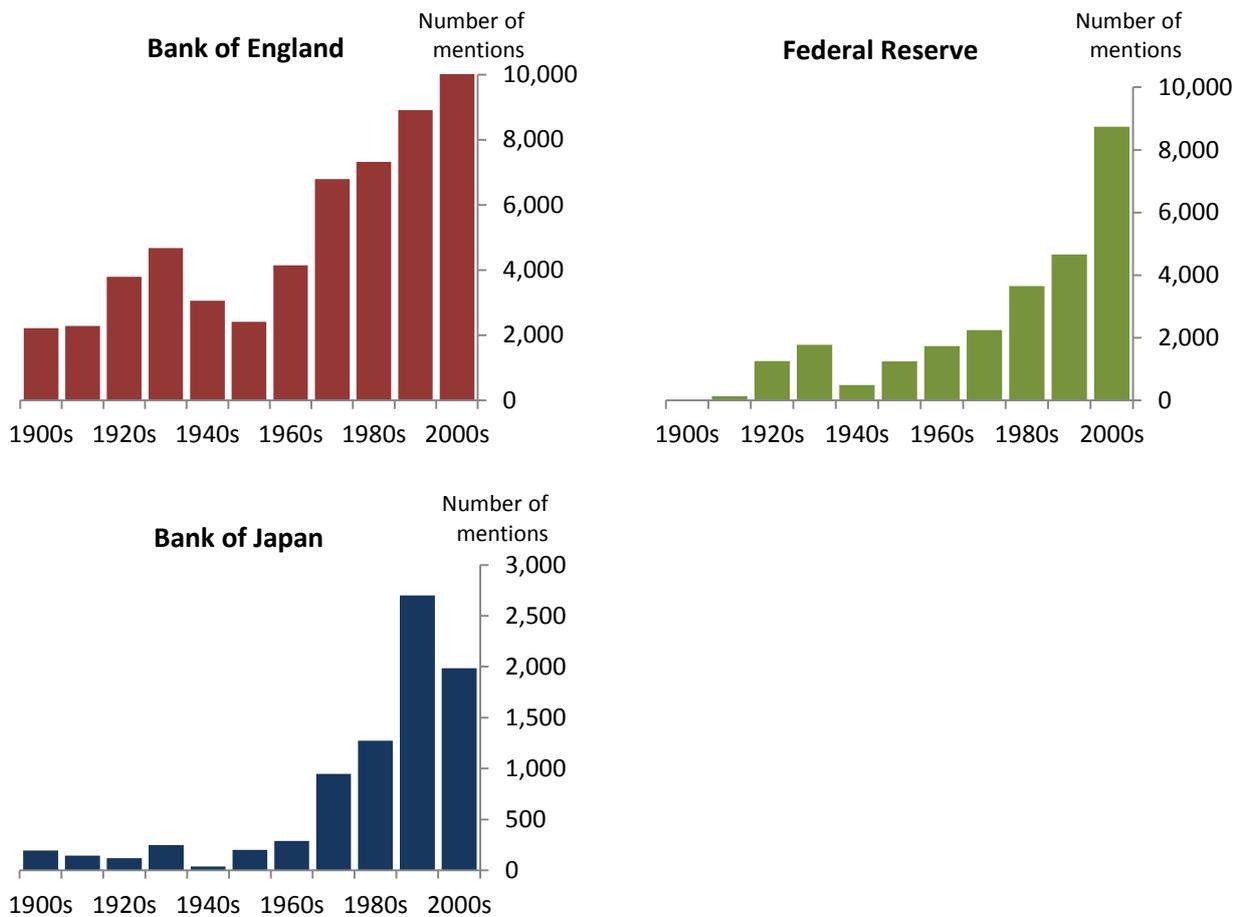
**Chart 6A: Mentions of central banks in *The Times* newspaper**



Source: Factiva.

Notes: Charts show number of mentions per decade.

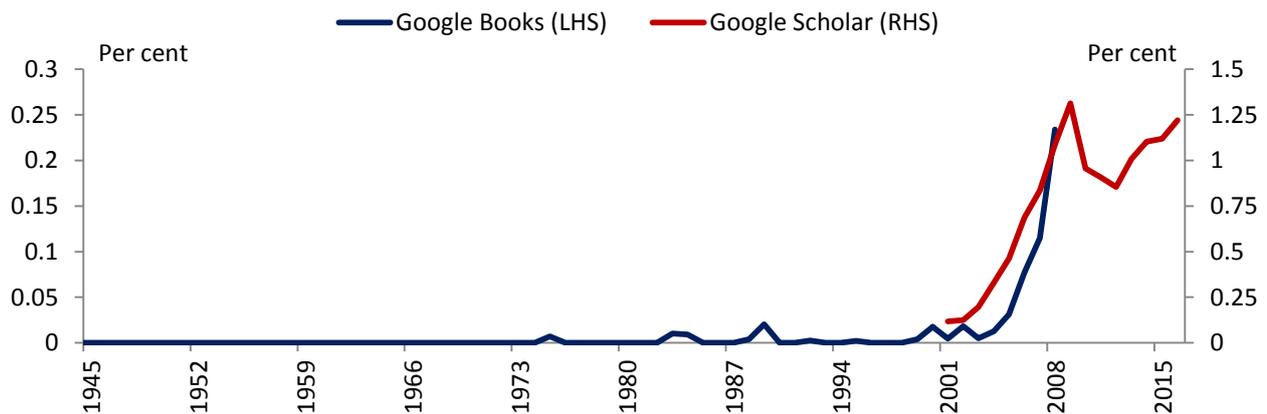
**Chart 6B: Mentions of central banks in *The Financial Times* newspaper**



Source: Factiva.

Notes: Charts show number of mentions per decade

**Chart 7: Publications containing 'central bank communication' as a percentage of publications containing 'central bank'**

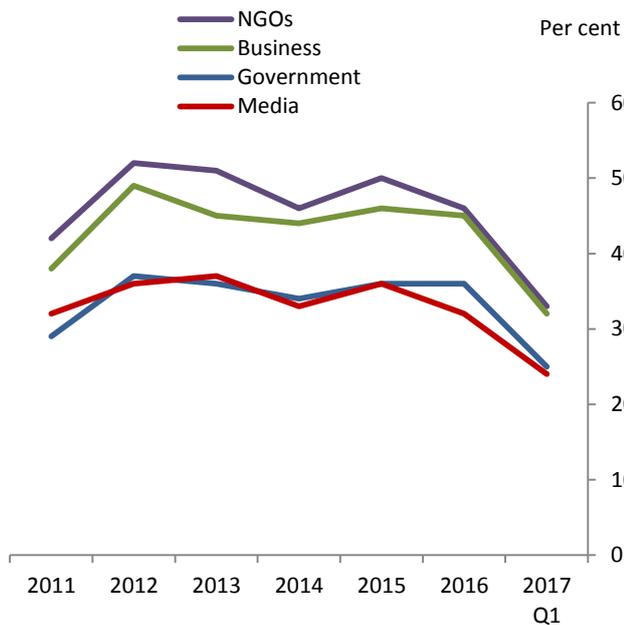


Source: Google Books Corpus, search of <http://scholar.google.com> on 23/03/2017.

Notes: Based on the methodology of Hansen and McMahon (2016).

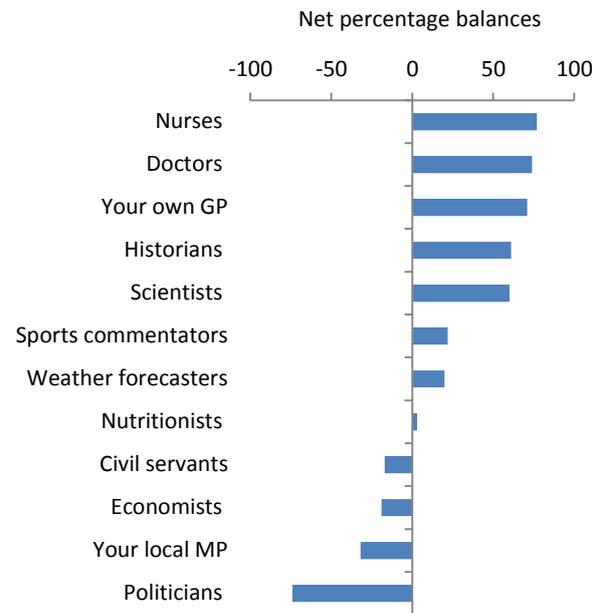


**Chart 10: Trust in institutions in the UK**



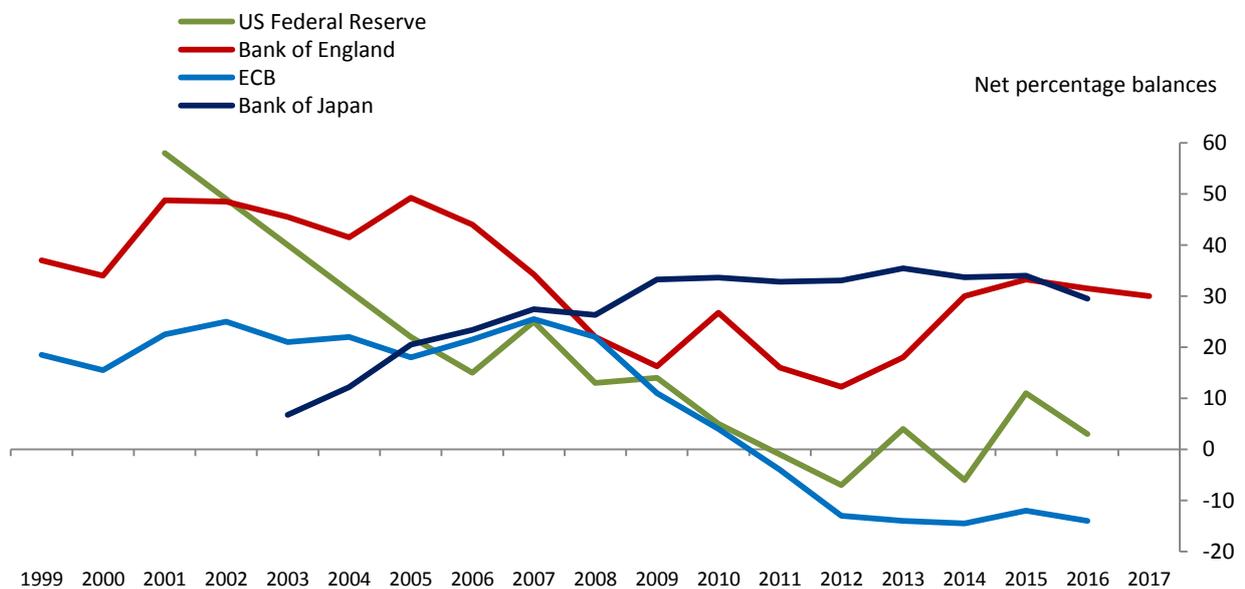
Source: 2017 Q1 Edelman Trust Barometer.  
Notes: Years refer to the date on which survey fieldwork commenced.

**Chart 11: Trust in professions in the UK**



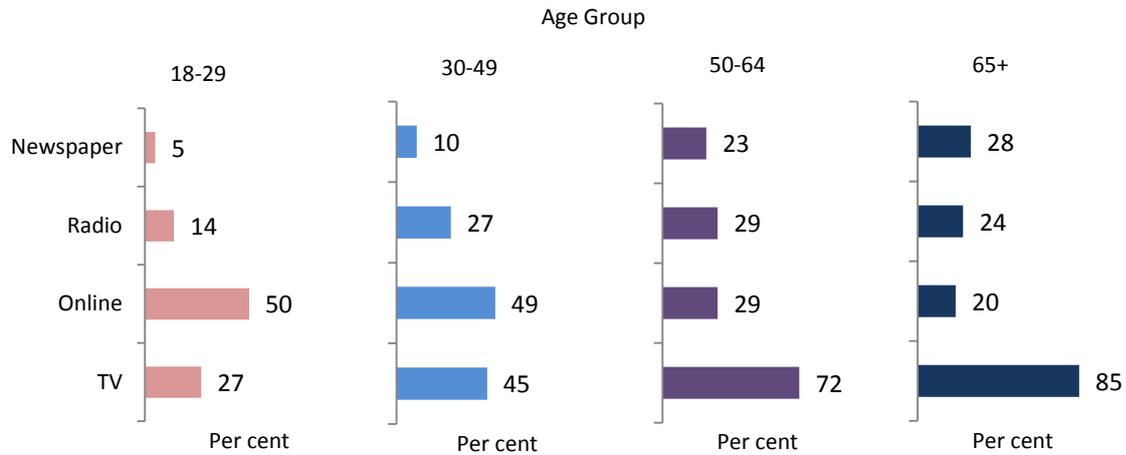
Source: YouGov, February 2017.

**Chart 12: Trust/confidence/satisfaction with central banks**



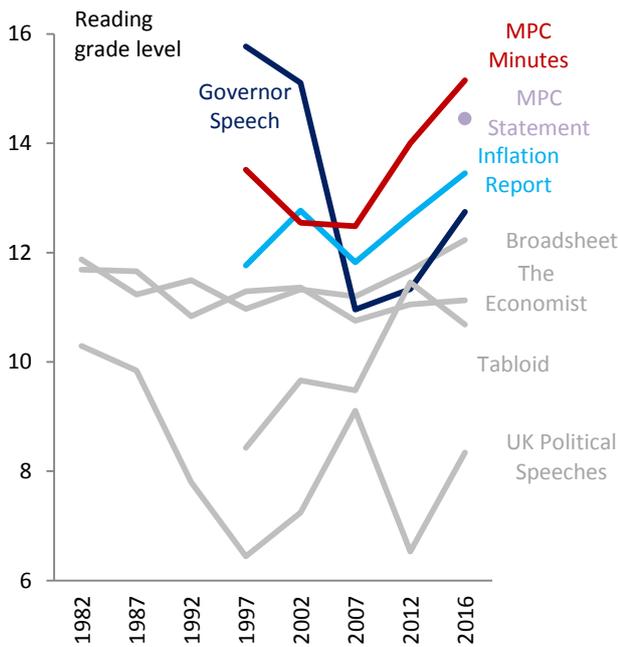
Sources: Bank of England, Eurobarometer, Gallup, Bank of Japan  
Notes: The US Federal Reserve line shows a Gallup poll of confidence in the economic leadership of the US, the ECB line shows a Eurobarometer measure of trust in the ECB, the BoJ line shows an opinion survey of confidence in the Bank of Japan and the BoE line shows TNS Survey results on satisfaction with the Bank's performance.

**Chart 13: How Americans of different ages got their news in 2016**



Source: Pew Research Centre (Barthel *et al*, 2016).

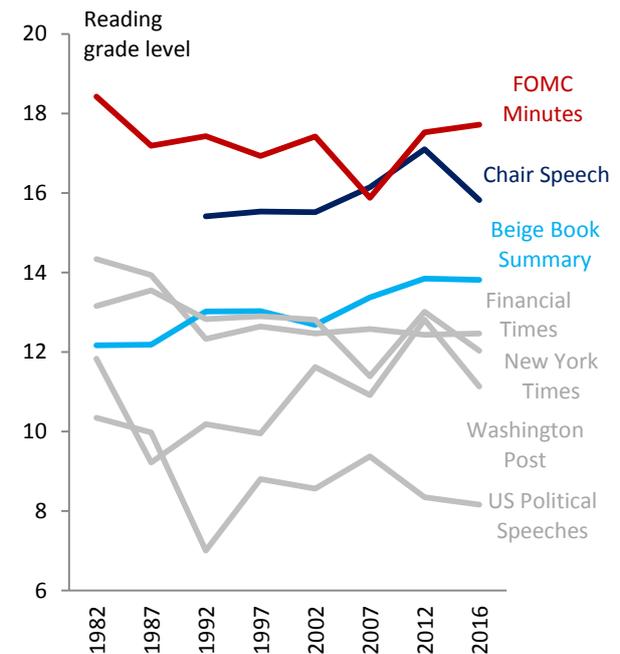
**Chart 14: Flesch-Kincaid reading grade level of BoE publications**



Sources: Nexis, Bank of England calculations

Notes: Newspaper and journal content matches a search for 'monetary policy'.

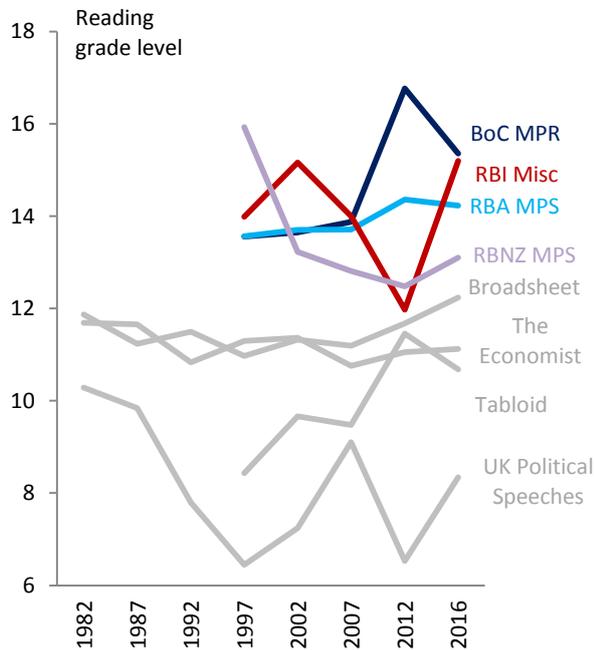
**Chart 15: Flesch-Kincaid reading grade level of US Fed publications**



Sources: Nexis, Bank of England calculations

Notes: Newspaper and journal content matches a search for 'monetary policy'.

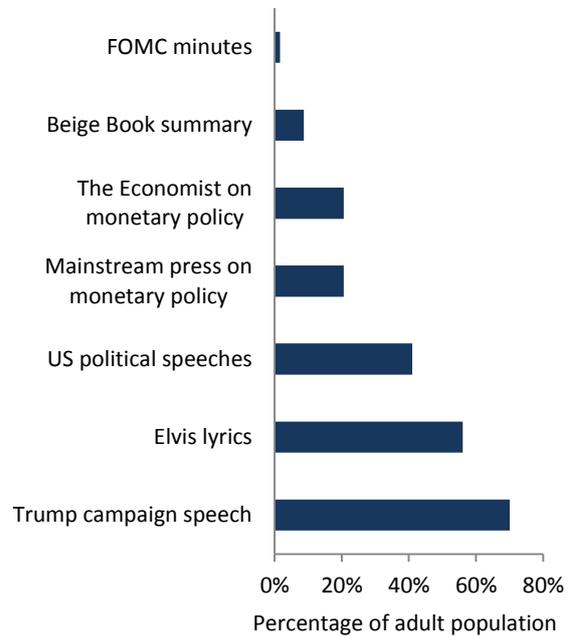
**Chart 16: Flesch-Kincaid reading grade level of other Central Banks**



Sources: Nexis, Bank of England calculations.

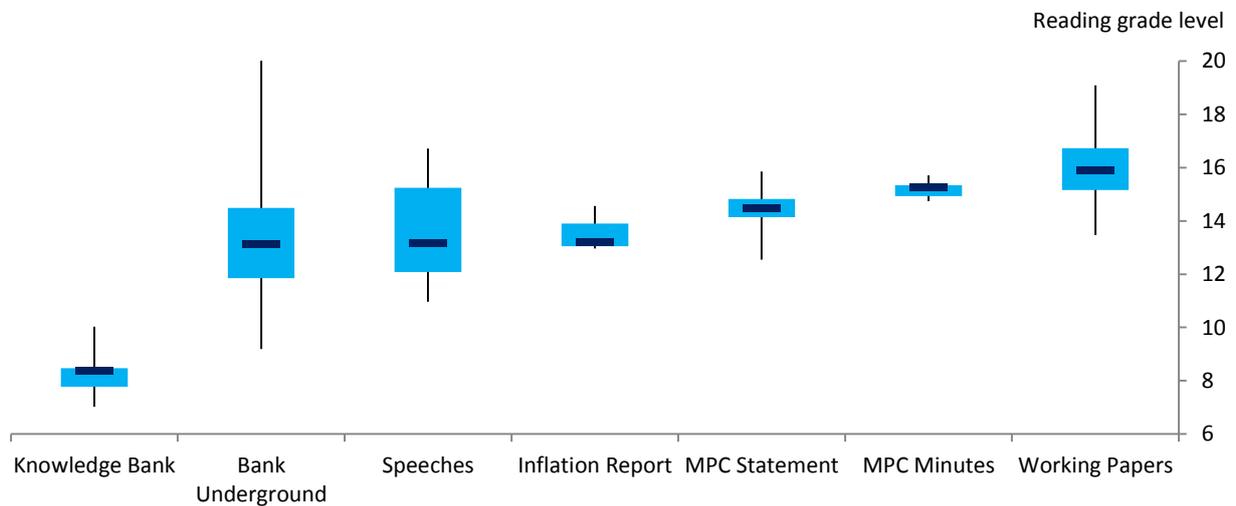
Notes: Newspaper and journal content matches a search for 'monetary policy'.

**Chart 17: Percentage of adult population for whom Elvis lyrics and 2016 communications are accessible**



Source: Bank of England calculations.

**Chart 18: Dispersion of Flesch-Kincaid reading grade for 2016 Bank of England publications (minimum, first quartile, median, third quartile and maximum)**



Source: Bank of England calculations.

**Table 1: Timeline of selected communication and transparency innovations for major central banks**

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
<b>Bank of England</b>	Inflation report launched. Quarterly forecasts.	Publish minutes of Governor-Chancellor policy meetings.			Operational independence. Minutes published. Press conferences.	More timely minutes.	Publish analysis of forecast accuracy.						
<b>Bank of Japan</b>						Regular monetary policy meetings. Announce policy. Publish minutes. Publish transcripts.	Qualitative forward guidance.	Publish forecasts.	State-contingent forward guidance.		Publish more timely policy rationale.	Publish policy model.	
<b>European Central Bank</b>						Established with formal inflation objective and operational independence.		Publish (staff) semi-annual forecasts.	Publish policy model.			Publish quarterly forecasts.	
<b>US Federal Reserve</b>	Publish minutes. Publish past transcripts.	Announce rate changes. Explain rationale.	Publish future transcripts.		Quantitative announcement and policy rationale.		Rationale even when no policy change.			Immediately announce individual voting record.	Qualitative forward guidance.	More timely minutes.	
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Bank of England</b>									State-contingent forward guidance.	Publish more detail about forecast. Independent evaluation office.	Publish transcripts. Publish minutes on day of decision.		
<b>Bank of Japan</b>				Policy rationale even when policy unchanged. More timely minutes.	Publish quarterly forecasts.				Formal inflation objective.		Publish individual forecasts and risk assessments.	Publish more detailed backgrounds for forecasts.	
<b>European Central Bank</b>									Qualitative forward guidance.	Publish more detail about forecast.	Publish minutes.		
<b>US Federal Reserve</b>		Publish quarterly forecasts.					Press conferences. Time-based forward guidance.	Formal inflation objective. Individual interest rate projections. State-contingent forward guidance.					Publish fan charts.

Sources: Danker and Luecke (2005), Eijffinger and Geraats (2006), Plosser (2011), Warsh (2014), Cordemans (2015), Blinder *et al* (2017), Praet (2017), Bank of Japan.

**Table 2: 2013 forward guidance survey results**

	<b>Effect on expectations for the next change in Bank Rate</b>					
	Remain low for longer than previously expected	No change	Rise sooner than previously expected	Don't know		
Percentages of households	23	43	13	22		
Percentages of companies, survey by Markit (Bank's agents)	45 (47)	34 (31)	14 (19)	7 (4)		
	<b>Effect on confidence</b>					
	Much more confident	Slightly more confident	No change	Slightly less confident	Much less confident	Don't know
Percentages of households	1	14	56	12	4	13
Percentages of companies, survey by Markit (Bank's agents)	7 (12)	51 (62)	39 (24)	3 (1)	0 (0)	0 (0)

Sources: Bank/GfK NOP survey and Markit. See February 2014 *Inflation Report* for more detail on the survey questions.

## References

- Acemoglu, D and Robinson, J (2012)**, *Why Nations Fail: The Origins of Power, Prosperity and Poverty*, Random House Inc.
- Adams, P and Hunt, S (2013)**, 'Encouraging consumers to claim redress: evidence from a field trial', Financial Conduct Authority, *Occasional Paper*, No.2.
- Akerlof, G and Shiller, R (2009)**, *Animal Spirits: How Human Psychology Drives the Economy and Why this Matters for Global Capitalism*, Princeton University Press.
- Arnove, M, Laurens, B and Segalotto, J-F (2006)**, 'The Measurement of Central Bank Autonomy: Survey of Models, Indicators, and Empirical Evidence', *IMF Working Paper*, No. 06/227.
- Barthel, M, Gottfried, J, Mitchell, A and Shearer, E (2016)**, 'The Modern News Consumer, News attitudes and practices in the digital era', Pew Research Center.
- Bank of England (2014)**, 'Transparency and accountability at the Bank of England', available at [www.bankofengland.co.uk/publications/Documents/news/2014/warshresponse.pdf](http://www.bankofengland.co.uk/publications/Documents/news/2014/warshresponse.pdf)
- Barber, B (1983)**, *The Logic and Limits of Trust*, Rutgers University Press.
- Berger, H, Ehrmann, M and Fratzscher M (2011)**, 'Monetary Policy in the Media', *Journal of Money, Credit and Banking*, Vol. 43, No. 4, p. 689-709.
- Bholat, D, Hansen, S, Santos, P and Schonhardt-Bailey, C (2015)**, 'Text mining for central banks', *CCBS Handbook*, No. 33.
- BIS (2009)**, 'Roles and objectives of modern central banks, Chapter 2 in *Issues in the Governance of Central Banks*, available at [http://www.bis.org/publ/othp04\\_2.pdf](http://www.bis.org/publ/othp04_2.pdf)
- Binkley, M (1997)**, 'Adult Literacy: An International Perspective', U. S. Department of Education, *Office of Educational Research and Improvement Working paper*, No. 97-33.
- Blinder, A, Ehrmann, M, Fratzscher, M, de Haan, J and Jansen, D (2008)**, 'Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence,' *Journal of Economic Literature*, American Economic Association, Vol. 46(4), p. 910-945.
- Blinder, A, Ehrmann, M, de Haan, J and Jansen, D (2017)**, 'Necessity as the mother of invention: Monetary policy after the crisis', *Economic Policy*, forthcoming.
- Bodea, C and Hicks, R (2015)**, 'Price Stability and Central Bank Independence: Discipline, Credibility, and Democratic Institutions', *International Organization*, Vol. 59, No. 1, p. 35-61.
- Botsman, R (2016)**, 'We've stopped trusting institutions and started trusting strangers', available at [ted.com](http://ted.com)
- Briault, C, Haldane, A and King, M (1997)**, 'Independence and Accountability', *Towards More Effective Monetary Policy*, Palgrave Macmillan UK, p. 299-340.
- Brunner, K (1981)**, 'The Art of Central Banking', *Centre for Research in Government Policy and Business Working Paper*, No. 81-6.
- Capie, F, Goodhard, C, Fischer, S and Schnadt, N (1994)**, *The Future of Central Banking – The Tercentenary Symposium of the Bank of England*, Cambridge University Press.
- Capie, F (2010)**, *The Bank of England 1950s to 1979*, Cambridge University Press.

- Carney (2016)**, 'The Spectre of Monetarism', speech available at [www.bankofengland.co.uk/publications/Documents/speeches/2016/speech946.pdf](http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech946.pdf)
- Carvalho, C and Nechio, F (2014)**, 'Do people understand monetary policy?', *Journal of Monetary Economics*, Vol. 66(C), p. 108-123.
- Claessens, S, Laeven, L and Cerutti, E (2016)**, 'The use and effectiveness of macroprudential policies', *Journey of Financial Stability*, forthcoming.
- Communic@tions Management Inc. (2013)**, 'Can daily newspaper "brands" survive the decline (and likely disappearance) of the printed product?', Discussion Paper.
- Cordemans, N (2015)**, 'Monetary policy communication in the wake of the great recession', *National Bank of Belgium Economic Review*, December 83-101.
- Crowe, C and Meade, E (2007)**, 'The Evolution of Central Bank Governance around the World', *Journal of Economic Perspectives*, Vol. 21, No. 4, p. 69-90.
- Crowe, C (2010)**, 'Testing the transparency benefits of inflation targeting: Evidence from private sector forecasts', *Journal of Monetary Economics*, Vol. 57, No. 2, p. 226-232.
- Cukierman, A, Webb, S and Neyapti, B (1992)**, 'Measuring the Independence of Central Banks and Its Effect on Policy Outcomes', *The World Bank Economic Review*, Vol. 6, No. 3, p. 353-398.
- Dankner, D and Luecke, M (2005)**, 'Background on FOMC Meeting Minutes', *Federal Reserve Bulletin*, Spring, p. 175-179.
- den Haan, W, Ellison, M, Ilizetzi, E, McMahon, M and Reis, R (2017)**, 'The future of central bank independence: Results of the CFM-CEPR Survey', article on *VoxEU*.
- Dincer, N and Eichengreen, B (2014)**, 'Central Bank Transparency and Independence: Updates and New Measures', *International Journal of Central Banking*, Vol. 10, No. 1, p. 189-259.
- Dincer, N and Eichengreen, B (2015)**, 'Central Bank Transparency Data for 1998-2014', available at <http://eml.berkeley.edu/~eichengr/data.shtml>
- Dräger, L, Lamla, M and Pfajfar, D (2016)**, 'Are survey expectations theory-consistent? The role of central bank communication and news', *European Economic Review*, Vol. 85(C), p. 84-111.
- DuBay, W (2004)**, *The Principles of Readability*, Costa Mesa, CA: Impact Information.
- Earle, J, Moran, C and Ward-Perkins, Z (2016)**, *The Econocracy: The perils of leaving economics to the experts*, Manchester University Press.
- Ehrmann, M and Fratzscher, M (2007)**, 'Communication by Central Bank Committee Members: Different Strategies, Same Effectiveness?', *Journal of Money, Credit and Banking*, Vol. 39, No. 2/3, p.509-541.
- Eijffinger, S and Geraats, P (2006)**, 'How transparent are central banks?', *European Journal of Political Economy*, Vol. 22, No. 1, p. 1-21.
- El-Erian, M (2016)**, *The Only Game in Town: Central Banks, Instability and Avoiding the Next Collapse*, Random House, USA.
- Eusepi, S and Preston, B (2010)**, 'Central Bank Communication and Expectations Stabilization', *American Economic Journal: Macroeconomics*, Vol. 2, No. 3, p. 235-271.
- Federal Reserve Bank of Atlanta Decision Maker Survey (2017)**, available at [www.frbatlanta.org/research/surveys/decision-maker/](http://www.frbatlanta.org/research/surveys/decision-maker/)

- Garriga, A (2016)**, 'Central Bank Independence in the World: A New Data Set', *International Interactions*, Vol. 42, No. 5, p. 849-868.
- Geraats, P (2002)**, 'Central Bank Transparency', *Economic Journal*, Vol. 112, p. 532–565.
- Goodfriend M (1986)**, 'Monetary Mystique: Secrecy and Central Banking', *Journal of Monetary Economics*, Vol. 17, p. 63-97.
- Govier, T (1997)**, *Social Trust and Human Communities*, Montreal: McGill-Queen's University Press.
- Graham, C (2017)**, *Happiness for All? Unequal Hopes and Lives in Pursuit of the American Dream*, Princeton University Press.
- Grilli, V, Masciandaro, D and Tabellini, G (1991)**, 'Political and Monetary Institutions and Public Financial Policies in the Industrial Countries', *Economic Policy*, Vol. 6, No. 13, p. 341-392.
- Gürkaynak, R, Sack, B and Swanson, E (2005)**, 'Do Actions Speak Louder Than Words? The Response of Asset Prices to Monetary Policy Actions and Statements', *International Journal of Central Banking*, Vol. 1, No.1, p. 55-93.
- Gürkaynak, R, Levin, A and Swanson, E (2010)**, 'Does Inflation Targeting Anchor Long-Run Inflation Expectations? Evidence from the U.S., UK and Sweden', *Journal of the European Economic Association*, Vol. 8, No. 6, p. 1208-1242.
- Haldane, A (2016)**, 'The Great Divide', speech at New City Agenda Annual Dinner, available at: [www.bankofengland.co.uk/publications/Documents/speeches/2016/speech908.pdf](http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech908.pdf)
- Haldane, A and Radia, A (2016)**, 'The need for discretion and rules: a commentary on John Taylor's lecture', Policy Stability and Economic Growth: Lessons from the Great Recession, *Readings in Political Economy*, Vol. 5.
- Halpern, D (2015)**, *Inside the Nudge Unit: How small changes can make a big difference*, WH Allen.
- Halpern, D (2016)**, 'It's time to bring more realistic models of human behaviour into economic policy and regulation', *Bank Underground*, available at <https://bankunderground.co.uk/2016/08/23/its-time-to-bring-more-realistic-models-of-human-behaviour-into-economic-policy-and-regulation/>
- Hansen, S and McMahon, M (2016)**, 'The nature and effectiveness of central-bank communication', article on *VoxEU*.
- Hansen S, McMahon, M and Prat, A (2014)**, 'Transparency and deliberation within the FOMC: a computational linguistics approach', *CEPR*, Discussion Paper 9994.
- Hayo, B, Kutan, A and Neuenkirch, M (2010)**, 'The impact of U.S. central bank communication on European and pacific equity markets', *Economic Letters*, Vol. 108, No. 2, p. 172-174
- Hendry, S and Madeley, A (2010)**, 'Text Mining and the Information Content of Bank of Canada Communications', *Bank of Canada Staff Working Paper*, No. 2010-31.
- Hubert, P (2015)**, 'Do Central Bank Forecasts Influence Private Agents? Forecasting Performance versus Signals', *Journal of Money, Credit and Banking*, Vol. 47, No. 4, p. 771–789.
- Joyce, M, Lildholdt, P and Sorensen, S (2010)**, 'Extracting inflation expectations and inflation risk premia from the term structure: A joint model of UK nominal and real yield curves', *Journal of Banking & Finance*, Vol. 34, No. 2, p. 281-294.
- Jung K, Shavitt S, Viswanathan, M and Hilbe, J (2014)**, 'Female hurricanes are deadlier than male hurricanes', *Proceedings of the National Academy of Sciences*, Vol. 111.24, p. 8782-8787.

- Kahneman, D (2011)**, *Thinking Fast and Slow*, Farrar, Straus & Giroux.
- Kincaid, J, Fishburne, R, Rogers, R and Chissom, B (1975)**, 'Derivation of New Readability Formulas (Automated Readability Index, Fog Count and Flesch Reading Ease Formula for Navy Enlisted Personnel', *Research Branch Report*, No. 8-75.
- King, M (2000)**, 'Monetary Policy: Theory in Practice', speech.
- Kirsch I, Jungeblut, A, Jenkins, L and Kolstad, A (1993)**, 'Adult Literacy in America: A First Look At The Findings of the National Adult Literacy Survey', *U.S. Department of Education*, NCES 1993–275.
- Kool, C, Middeldorp, M and Rosenkranz, S (2011)**, 'Central Bank Transparency and the Crowding Out of Private Information in Financial Markets', *Journal of Money, Credit and Banking*, Vol. 43, No. 4, p. 765-774.
- Lamla, M and Lein, S (2014)**, 'The role of media for consumers' inflation expectation formation', *Journal of Economic Behavior & Organization*, Vol. 106(C), p. 62-77.
- Liisberg, S, Pedersen, E and Dalsgård, A (eds.) (2015)**, *Anthropology & Philosophy, Dialogues on Trust and Hope*, Berghahn Books.
- Mackay, C (1841)**, *Memoirs of Extraordinary Popular Delusions*, London: Richard Bentley.
- Mandelbrot, B and Hudson, R (2004)**, *The (Mis)Behavior of Markets: A Fractal View of Financial Turbulence*, Basic Books.
- Meltzer A (2009)**, *A History of the Federal Reserve, Volume 2*, University of Chicago Press.
- McKeown, J and Paterson, L (2014)**, 'Enhancing the transparency of the Bank of England's *Inflation Report*', article on *VoxEU*.
- Monetary Policy Committee (2013)**, 'Monetary policy trade-offs and forward guidance', available at [www.bankofengland.co.uk/publications/Documents/inflationreport/2013/ir13augforwardguidance.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2013/ir13augforwardguidance.pdf)
- Morris, H and Shin, S (2002)**, 'Social value of public information', *American Economic Review*, Vol. 92, No. 5, p. 1521-1534.
- Nyman, R, Gregory, D, Kapadia, S, Ormerod, P, Tuckett, D and Smith, R (2016)**, 'News and narratives in financial systems: exploiting big data for systemic risk assessment', mimeo.
- O'Neill, O (2002)**, 'A Question of Trust', *BBC Reith Lectures*.
- O'Neill, O (2014)**, 'Trust, Trustworthiness, and Accountability', in Morris, N and Vines, D (ed.): *Capital Failure: Rebuilding Trust in Financial Services*.
- Praet, P (2017)**, 'Have unconventional policies overstretched central bank independence? Challenges for accountability and transparency in the wake of the crisis', speech.
- Plosser, C (2011)**, 'Toward Clarity in Monetary Policy', available at [www.philadelphiafed.org/publications/annual-report/2011/toward-clarity-in-monetary-policy](http://www.philadelphiafed.org/publications/annual-report/2011/toward-clarity-in-monetary-policy)
- Ranaldo, A and Rossi, E (2010)**, 'The reaction of asset markets to Swiss National Bank communication', *Journal of International Money and Finance*, Vol. 29, No. 3, p. 489-503.
- Reis, R (2013)**, 'Central Bank Design', *Journal of Economic Perspectives*, Vol. 27, No. 4, p. 17-44.
- Roy, H, Pocock, M, Preston, C, Roy, D, Savage, J, Tweddle, J, Robinson, L (2012)**, 'Understanding Citizen Science & Environmental Monitoring. Final Report on behalf of UK Environmental Observation Framework'.

**Reuters Institute for the Study of Journalism (2016)**, *Reuters Institute Digital News Report 2016*.

**Sapienza, P and Zingales, L (2013)**, 'Economic Experts versus Average Americans', *American Economic Review*, Vol. 103, No. 3, p. 636-642.

**Sentance (2015)**, 'We expect too much of the new masters of the universe', article in the *Financial Times*.

**Shafik, M (2017)**, 'In experts we trust?', *speech* available at <http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech964.pdf>

**Shannon, C (1948)**, 'A Mathematical Theory of Communication', *Bell System Technical Journal*, 27 (3)

**Shiller, R (1997)**, 'Why Do People Dislike Inflation?', *Reducing Inflation: Motivation and Strategy*, NBER, p. 13-70.

**Shiller, R (2017)**, 'Narrative Economics', *NBER Working Paper*, No. 23075.

**Smart, L (2016)**, 'Full disclosure: a round-up of FCA experimental research into giving information', Financial Conduct Authority, Occasional Paper 23.

**Stockton, D (2012)**, 'Review of the Monetary Policy Committee's Forecasting Capability', available at [www.bankofengland.co.uk/publications/Documents/news/2012/cr3stockton.pdf](http://www.bankofengland.co.uk/publications/Documents/news/2012/cr3stockton.pdf)

**Strunk, W and White, E (1979)**, *The Elements of Style*, Idg Books (3rd edition).

**Sturm, J and de Haan, J (2009)**, 'Does Central Bank Communication really Lead to better Forecasts of Policy Decisions? New Evidence Based on a Taylor Rule Model for the ECB', *CESifo Working Paper Series*, No. 2760.

**Taylor, J (2011)**, 'Legislating a Rule for Monetary Policy', *Cato Journal*, vol. 31(3), p. 407-415.

**Taylor, J (2012)**, 'Monetary Policy Rules Work and Discretion Doesn't: A Tale of Two Eras', *Journal of Money, Credit and Banking*, 44: 1017-1032.

**Tetlock, P and Gardner, D (2016)**, *Superforecasting: The Art and Science of Prediction*, Broadway Books.

**Thaler, R and Sunstein, C (2008)**, *Nudge: Improving decisions about health, wealth, and happiness*, Yale University Press.

**Thompson (2016)**, *Enough Said: What's gone wrong with the language of politics?*, Bodley Head.

**US Congress (2015)**, 'Fed Oversight Reform and Modernization Act of 2015', H.R. 3189, 114 Cong. (2015).

**van der Cruijssen, C, Jansen, D-J and de Haan, J (2015)** 'How much does the public know about the ECB's monetary policy? Evidence from a survey of Dutch households', *International Journal of Central Banking*, Vol. 11, No. 5, p. 169-218.

**Warsh, K (2014)**, 'Transparency and the Bank of England's Monetary Policy Committee', available at [www.bankofengland.co.uk/publications/Documents/news/2014/warsh.pdf](http://www.bankofengland.co.uk/publications/Documents/news/2014/warsh.pdf)

**Williams, J (2014)**, 'Policy rules in practice', *Journal of Economic Dynamics and Control*, vol. 49(C), p. 151-153.

**Williams, J (2015)**, 'Monetary policy and the independence dilemma', *FRBSF Economic Letter*, Federal Reserve Bank of San Francisco.

**Williams (2016a)**, 'The Heath of Nations', presentation to the National Interagency Community Reinvestment Conference

**Williams, J (2016b)**, 'Rules of engagement', *FRBSF Economic Letter*, Federal Reserve Bank of San Francisco.

**World Bank (2003, 2007, 2011)**, Bank Regulation and Supervision Survey.

**Yellen, J (2017)**, 'The Economic Outlook and the Conduct of Monetary Policy', *speech* available at <https://www.federalreserve.gov/newsevents/speech/yellen20170119a.htm>