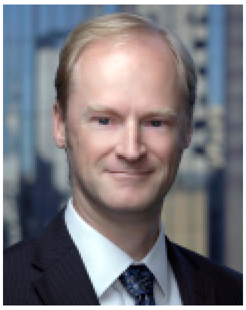
RESERVE BANK OF AUSTRALIA

Speech

Ten Years of Research – What Have We Learnt Since the Financial Crisis?

John Simon [*] Head of Economic Research



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Introduction

In thinking about what we have learnt since the GFC there are a number of approaches you could take. You could review the experience to look at mistakes that were made. For example, the fact that 105% LVR housing loans were ever thought to be prudent is surprising, but a demonstration of something that has been learnt. Similarly, you could look at what worked. For example, Andrew has just discussed the fiscal response to the crisis and, in that respect, there is general agreement that fiscal stimulus worked. This learning is not exactly new, but sometimes you need to be reminded of things that you may have forgotten. [1] With respect to monetary policy we have learnt that there are more tools in the monetary kit bag than just the interest rate lever.

I, however, want to take a slightly different approach that is focused not on the GFC itself and what we did, but on today. I want to look at how we do and understand things differently now compared to before the crisis. I want to do this because I think the best way to judge what you have truly learnt is to look at the way you have changed as a result. If your behaviour doesn't change, can it really be said that you have learnt anything? So I want to talk about how we conduct research differently and what that implies for how we think about the economy.

Reflecting this focus, I will not be talking about the lessons learnt by those who were responsible for keeping the lights on during the crisis. For that I would suggest you read Ben Bernanke's memoir, 'The Courage to Act' [2] or, for an Australian reflection, the talk given by Guy Debelle last year. [3] This is very much a talk about the ongoing changes that the GFC caused to the practice of economics rather than a talk about lessons for crisis management or crisis prevention.

Exposition: What have we learnt?

So, how do we think about things differently now compared to ten years ago? As I've mentioned, I think a good way to see this is to look at how our behaviour has changed. And, in the field of research, that comes down to looking at what we write and the questions we choose to spend our time investigating. Inherent in those choices are judgements about what we think is important and what we still don't know. As such, it reflects what we have learnt.

RBA research

To get a sense of what we have learnt, I read over the more than 200 discussion papers the RBA has released between 2000 and now.[4] I focus on the research at the RBA both because it is what I know well and because it will tend to reflect the intellectual currents within the institution charged with setting monetary policy in Australia – even though, to quote the disclaimer on the cover of every RDP, 'Views expressed in this paper are those of the authors and not necessarily those of the Reserve Bank'.

To save you the time of doing this yourself and to give you a sense of how what we've been writing has changed, I stuck all those words into a great big copper pot still and distilled them into this word cloud.[5]

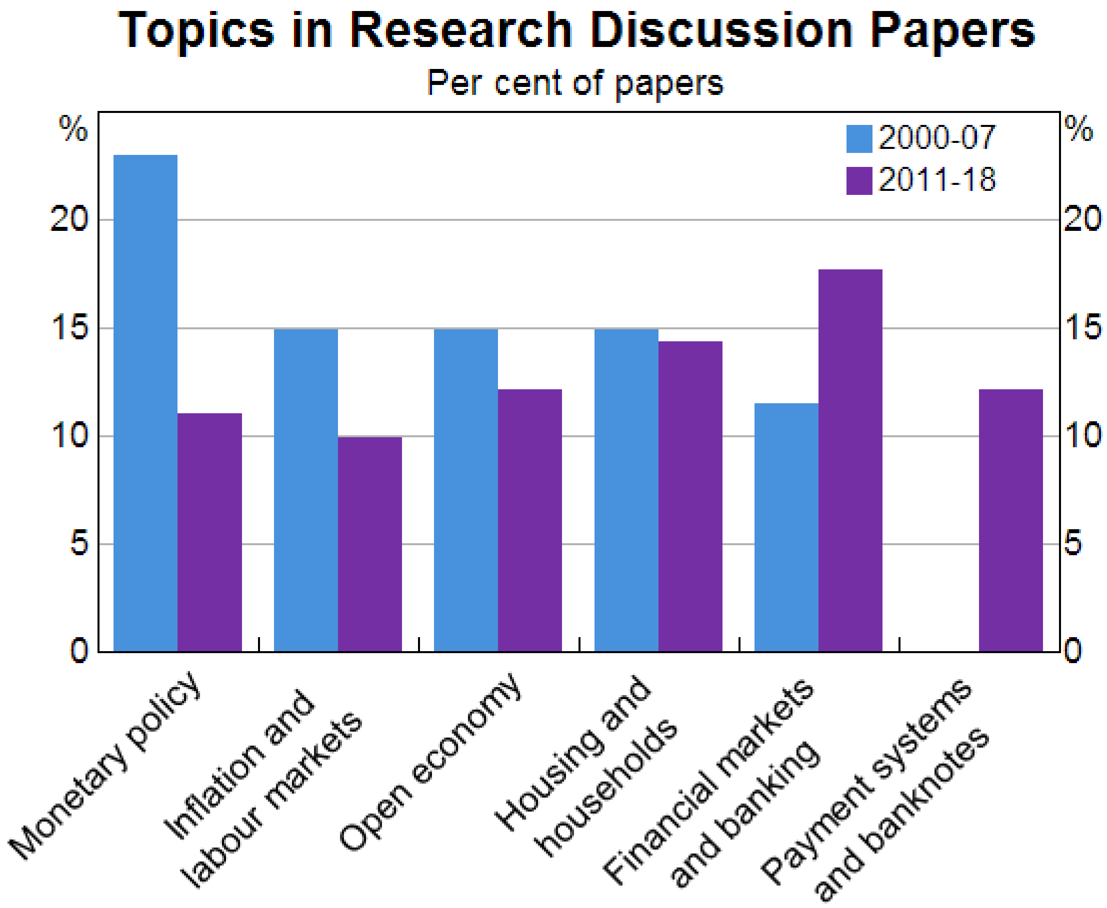
Graph 1

This word cloud has two halves. The top half shows the key words we were using in RDPs written before the financial crisis and the bottom half shows the key words we were using in RDPs written since the financial crisis.

As you can see, a very common pre-crisis term was 'monetary policy' with some recurring discussion of 'exchange rates', 'assets' and 'components'. Since the crisis 'shock' has become more common and we see both 'financial crisis' and 'global financial (crisis)' – perhaps not that surprising – but there is also a lot more discussion of terms like 'consumer', 'system' and 'resource'.

So that gives you a high level feeling for what has changed. To get a better idea about what has changed I grouped the RDPs by topic to see how the questions we are asking have changed.

Graph 2



This graph shows how the main topics covered in the RBA's Research Discussion Paper series have changed since the financial crisis. The topics are drawn from the keywords used by authors to summarise their paper. These are not all of the topics covered, the bars do not add up to 100 percent, but these are the most common topics. I have sorted those topics putting the ones that have declined since the financial crisis on the left and the ones that have increased on the right. Thus, we can see that research on monetary policy, and inflation and labour markets has declined while research on financial markets and payments systems has increased. This is in line with what you can see in the word cloud.

While there are insights to be drawn from each of these areas, I want to focus on three of them to characterise the changes since the financial crisis: monetary policy, open economy, and financial markets and banking.

To start, the research on 'monetary policy' is typically an investigation of how to conduct monetary policy in particular circumstances. It generally uses a model of the economy to conduct various experiments on how monetary policy should operate. The titles of these papers gives a better idea of what was being studied. Some representative titles are 'Inflation targeting and exchange rate fluctuations in Australia', 'The real-time forecasting performance of Phillips curves', and 'Monetary policy, asset-price bubbles and the zero lower bound'. These are papers that have helped to refine the inflation targeting framework in Australia. Words from the word cloud, such as, 'component' reflect the fact that a number of the monetary policy questions being addressed were operational in nature, for example 'are some components of inflation better indicators than others?' The importance of this topic explains why the term 'monetary policy' was showing up in the word cloud.

The fact that the quantity of such papers has declined over time might be thought surprising. But this decline is a sign of learning. As questions about the monetary policy framework are answered, and as the answers prove to be good answers, there are less questions to be asked.

Indeed, the monetary policy framework, refined through years of research and experience, has stood the test of time remarkably well. Despite the experience of the financial crisis, circumstances have not changed in such a way as to reveal a fundamental weakness in the framework. In particular, the RBA held a conference last year to discuss the experience of the past twenty five years of inflation targeting in Australia.[6] The general feeling among the wide range of experts present was that the flexible inflation targeting framework has proven to be remarkably robust despite it having to deal with some major challenges: the GFC of course, but also the Asian financial crisis and the mining boom. One thing we have learnt is that the flexible inflation targeting framework works.

In contrast to the topic of monetary policy, one field where research has increased dramatically is research on financial markets and banking. This showed up in the word cloud with the prevalence of the terms 'financial crisis' and 'global financial'. Looking at this research more closely shows that, while the quantity of research has increased, the questions have also changed. They have changed not because the previous research was wrong but because the circumstances they were analysing have changed. The history they were responding to was different and the research adjusted accordingly.

Representative titles in the pre-GFC period are 'The efficient markets hypothesis: A survey', 'The effect of macroeconomic conditions on banks' risk and profitability', and 'Identifying the efficacy of central bank interventions: Evidence from Australia'. Since the crisis representative titles are 'Assessing some models of the impact of financial stress upon business cycles', 'Central counterparty links and clearing system exposures', and 'A density-based estimator of core/periphery network structures: Analysing the Australian interbank market'.

It is here that we can see a change I will return to later: there is a shift from a relatively macroeconomic perspective, and one more focused on efficiency, towards analysing the plumbing of markets and the ways market structure can affect outcomes. This reflects, in part, the experience of the financial crisis where the precise network of connections between market participants had a large effect on the overall functioning of markets. A few key players turned out to be at the heart of many markets. Financial markets are not, as was occasionally assumed, made up of atomistic individuals with no market power rationally processing perfect information in a frictionless market. Rather, they are populated by large players operating in an environment where the right information is hard to find, transactional frictions are large and non-linearities are rife.

Now, these issues were not unknown prior to the crisis. The change is more that there has been a much deeper realisation that traditionally microeconomic issues do not wash out in the aggregate and can have macroeconomic consequences.

Finally, while the relative quantity of research on open economy topics did not change much, the focus within the topic did. It changed from mostly being work on the exchange rate to work focused on the terms of trade. Earlier papers were concerned, for example, with investigating the way monetary policy should account for exchange rate movements and the way the exchange rate responded to policy changes. In that respect it can be thought of as part of the monetary policy research – thinking about how inflation targeting works in an open economy. More recently the research has been focused on the unprecedented terms of trade changes associated with the mining boom.

This highlights an important point about post-GFC research in Australia. We had a very different experience to that of the rest of the world. Instead of dealing with a housing market crash or sovereign debt crisis, we were in the midst of an unprecedented mining investment boom. The policy challenges were different and so the things to be learnt were different. We weren't, as many other central banks were, studying whether quantitative easing or negative interest rates work. (Although, that doesn't mean that we weren't learning from their experience.) Rather, because our priorities were different our research was directed elsewhere.

One particular thing we have learnt from this experience is that the adjustment process has been very drawn out. We have learnt that these sorts of events have effects that can last for decades. In this respect, what we have learnt is not that different to what has been learnt overseas. We have all seen that cycles are much longer than they used to be, and this means that policy making needs to think more than just a few years down the road.

Other insights could be gained by looking at the other topics in turn. But I would like to turn from a discussion of the questions we were asking, to look at how we were answering them. In particular, by looking not just at what we investigate, but at how we investigate it, we can get an additional perspective on what we have learnt.

A development: More use of microeconomic data

In that respect there is one dominant and obvious change. It is that pre-crisis papers had a tendency to focus on macroeconomic data while post-crisis papers have a much greater focus on the use of microeconomic data. I have already mentioned this change in my discussion of the financial markets research, but it is present in all of the topics I highlighted above. For example, within the housing and households research there has been a trend from looking at aggregate household sector balance sheets towards looking at individual household balance sheets.

I think this change reflects a number of mutually reinforcing trends. First and foremost, the financial crisis highlighted how individual actions could cause profound macroeconomic effects. Moral hazard and asymmetric information, traditionally microeconomic concerns, were seen to have macroeconomic effects as they were magnified through the financial system.

Second, within the economics profession generally, there was increasing dissatisfaction with rational expectations and representative agent assumptions. This can be seen most clearly with the rise of behavioural economics and the awarding of the Nobel Prize to Daniel Kahneman in 2002, Robert

Schiller in 2013 and Richard Thaler in 2017. But it is also present in the way more and more 'frictions' are being incorporated in modelling frameworks. For example, the consequences of household heterogeneity, particularly the fact that some households are liquidity constrained, has seen the development of Heterogeneous Agent New Keynesian (HANK) models that can give quite different predictions to more standard New Keynesian models. [7]

Finally, as computers have become more powerful there has been increasing ability to create, access and analyse much larger data sets. And as the initial results from these sorts of analysis have become available, and as more and more people have seen the potential in these datasets, there has been an increasing willingness to make this sort of data available to researchers.

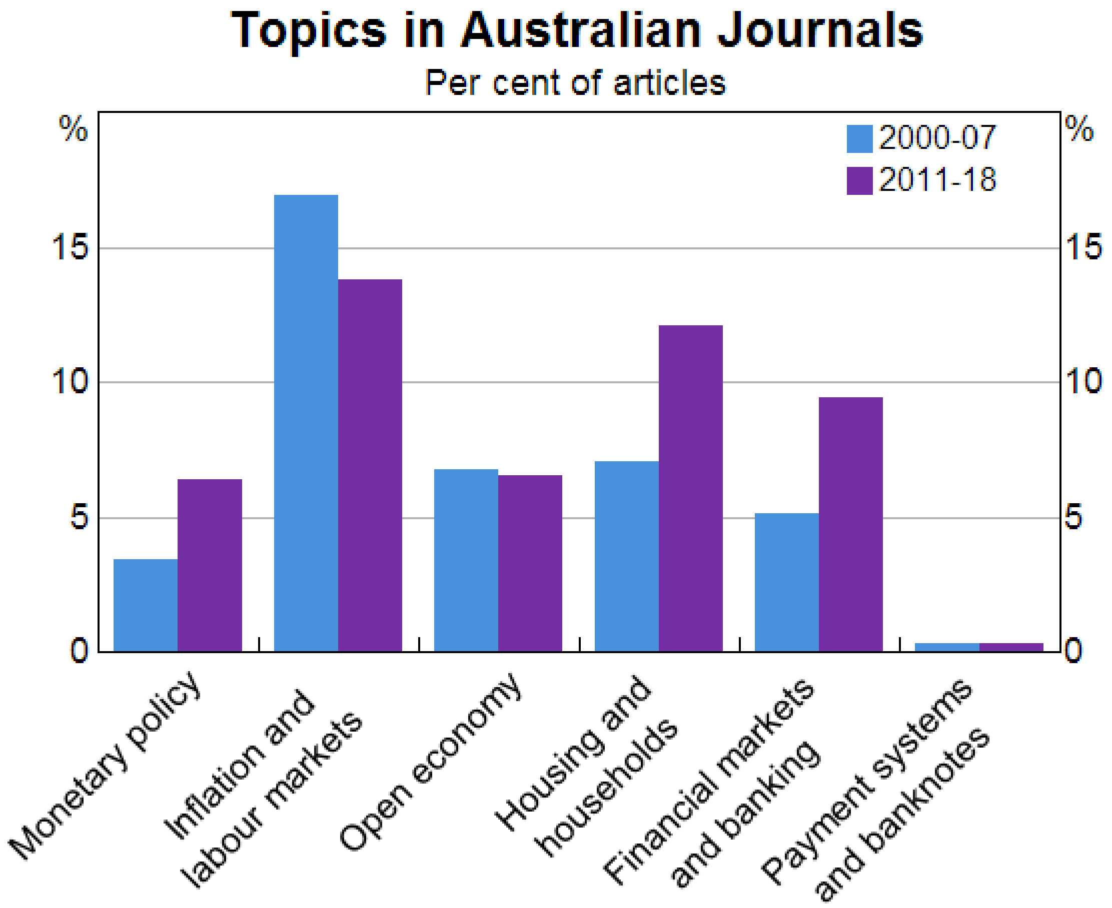
In Australia these forces have led to quite a change over the past few years. The increase in computing power has meant that large administrative data sets are being created to support the operations of the government. More importantly, as the potential of these datasets has been realised, the ABS and federal government are increasingly providing researchers with access to this data to enable them to answer some important policy questions. For example, the RBA has worked with the ABS on a number of projects that have looked at the detailed price and wages data collected by the ABS. Research released by the RBA last year made use of individual business investment data to find that the GFC investment tax break had a strong effect on business investment that was important at the macroeconomic level. [8]

So overall, following my proposition that what you do reflects what you have learnt, the more microeconomic nature of research at fundamentally macroeconomic institutions like the RBA shows that we have learnt the value in this kind of research. We have learnt that microeconomic data can help us answer some macroeconomic questions. Moreover, I would argue, we have learnt that microeconomic factors can affect macroeconomic outcomes. Not only are we, as Milton Freidman famously said, 'all Keynesians now' but, apparently, we are all microeconomists too.

Variation on the theme: What about economics in Australia?

So far I've been talking about research at the RBA. Given our responsibilities and mandate this means that our research has a particular slant. So, before I conclude, I would like to talk briefly about the pattern one observes in the broader economics community in Australia. To do this I have looked at all the articles published in the Australian Economic Review and the Economic Record. The graph below shows what proportion of research published in these two general interest Australian journals is on the particular topics I identified earlier.

Graph 3



There are a number of interesting differences here. First, the quantity of research on monetary policy is lower as a proportion of all the published research. This is hardly surprising. What is more surprising is that the absolute number of articles published is also low. Between 2000 and 2007 there were 22 articles published in the two journals on monetary policy compared with 20 by the RBA. I realise this is not the sum total of monetary policy research in Australia, but I think its low representation in these general interest journals is surprising. Since the financial crisis, however, research on monetary policy has increased – reflecting, I think, the pivotal role of monetary policy in economic management since the crisis. While it is natural for the Reserve Bank to specialise in this area it is equally important that we are not the only voice on this topic. Without discussion and debate, knowledge will only advance slowly.

Another area where you can see the RBA's particular focus and expertise being evident is research on payment systems. It is clearly a specialised area but, as I mentioned above, knowledge about the plumbing of the financial system is much more important now than prior to the crisis.

Across the other main topics I identified, however, it is clear that there has been a significant and increased amount of research on topics that are key to our understanding of the Australian economy. This is good to see and leads me to a final lesson. We learn when we share and discuss ideas with others. During the financial crisis there were a lot of late night phone calls as policy makers around the world shared information and discussed ideas as they grappled with the crisis. This led, I think, to better results than if policy makers were just operating alone. This lesson applies just as strongly to normal times. The increased quantity of work on these topics in Australia means there are many more people to talk to and learn from than there were prior to the crisis. We in the research department in particular, have been working to increase our engagement with academia and we look forward to learning a lot more about the way the economy works as a result of that engagement in the coming ten years.

Recapitulation

I started this talk by suggesting that you can tell a lot about what someone has learnt by looking at what they do. Looking over the research at the Reserve Bank, and more broadly, you can see a number of important changes. We have learnt that flexible inflation targeting is a pretty good policy framework. It has helped us, not only in the past ten years, but for twenty five years to have a remarkably resilient economy.

We have also learnt that the world is not nearly as efficient as we would like. In financial markets the network of connections between participants can influence how well a given market can deal with stress. The plumbing matters. We have also learnt that major events can have long lasting consequences. Indeed, a growing body of economic research has demonstrated how events from centuries ago can continue to have an effect on economic growth today.[9]

More broadly, we have learnt that microeconomics provides useful ideas and tools to understand macroeconomic questions. The links between microeconomic behaviour and macroeconomic outcomes are not, however, well understood. As a result, it is clear that we have a lot more to learn about this area.

Coda: What have I learnt since the financial crisis?

Before I end I would like to add a personal coda to this discussion. For, while this talk inevitably reflects my perspective, I have mostly focused on what learning is evident in the research that has been published – applying a researcher's eye to the research itself to maintain a degree of objectivity. Talking about what I have learnt will reflect my personal experiences and be more subjective. Nonetheless, it also allows me to turn the focus from what we have learnt so far to what this means for the future. In particular, I think the growing understanding about the links between microeconomic behaviour and macroeconomic outcomes is likely to have important implications for how we understand and manage the economy. To be clear, this is just what I have taken away from the research and my experience rather than the views of either the Reserve Bank or anyone else at the Reserve Bank.

In doing this I will be talking from the perspective of an economist who has spent most, although not all, of his working life at the Reserve Bank of Australia. I started at the Bank in 1992 just before inflation targeting was introduced and just after the last Australian recession. Over that period inflation has been remarkably stable. I did my PhD on the Great Moderation – before it was called the Great Moderation – and, as I implied, haven't experienced a recession during my working life. Output growth has also been remarkably stable over that period.

So, what have I learnt? The main thing that I have learnt is that small things matter. And for me, that is quite a change. The reason this is such a change is that, as a macroeconomist I have tended to be particularly conscious of general equilibrium effects. These general equilibrium effects lead, in my view, to economic systems that have a tendency towards stability and self-correction. Things can't get too out of whack and, to use an analogy from chaos theory, when a butterfly flaps its wings, nothing much happens.

This inherent stability is, I believe, a reflection of the institutional structure of the economy. A good example of a stabilising institution, it should not surprise you to hear me say, is an independent inflation targeting central bank. The presence of such an institution in an economy not only has a direct effect on stability but also, through the expectations of everyone that it will act to stabilise the economy, an indirect effect.

But, as I mentioned, my views have changed and evolved since the financial crisis. There are two aspects to what I've learnt about small things mattering. The first is that individual biases don't necessarily wash out at the macroeconomic level. The second is that people are affected by a great many behavioural biases (myself included).[10]

The experience of the financial crisis showed just how individuals responding to behavioural incentives and deciding to buy a house in, say, Nevada could snowball through the system to precipitate the global financial crisis. It showed how the presence of moral hazard could render financial markets inherently unstable for a time and, to this day, how behavioural biases lead to risk on and risk off cycles in global financial markets.

I may not be alone in learning this, but the conclusions I draw from it might be somewhat different. In particular, while I still think that an economic system can be inherently stable, I don't think it will happen by accident. As such, there have to be some big decisions made about the design of institutions and systems that take account of the fact that everyone, including regulators, are affected by these behavioural biases.

Taking the learnings from behavioural economics fully to heart would mean that, instead of assuming rationality in the way systems are designed, known behavioural biases are embedded instead. One example would be in thinking about the way financial products are regulated. The general philosophy in both consumer and business contexts had been that disclosure will allow people to make informed decisions about which products are right for them. The fact that even highly sophisticated financial market participants bought products that they fundamentally didn't understand, however, shows that disclosure isn't enough.

The insights from behavioural economics also apply to institutional culture. There is a much greater appreciation now for how institutional culture can affect the behaviour of both regulators and corporations. Institutional culture is, at heart, the accumulation of lots of individual behavioural biases. As such, institutional changes that acknowledge and address all too human behaviours would help to make both them and the economic system more stable. That is, you need to take account of human psychology and cultural incentives and consciously design institutions around them.

In conclusion, and I mean it this time, I think that a lot has been learnt since the financial crisis. The most important to me are the lessons about how small things matter – that is, that individual behaviour doesn't necessarily average out. Furthermore, the true test of whether we have learnt these lessons, is how we behave differently as a result. In that respect, I think changes in the way regulations and institutions are designed are an important and ongoing need.

Endnotes

[*] I would like to thank Joan Huang and Rebecca Bollen Manalac for their help in preparing this talk.

[1] In particular, there had been a view that fiscal policy had long implementation lags and couldn't be used for short-term demand management. The crisis response demonstrated that that wasn't necessarily true.

[2] Bernanke, Ben (2015), *The Courage to Act*, New York, W.W. Norton & Company.

[3] Debelle, Guy (2018) 'Lessons and Questions from the GFC', Address to the Australian Business Economists Annual Dinner, Sydney, 6 December 2018.

[4] You can find them all on the RBA website at https://www.rba.gov.au/publications/rdp/about.html

[5] Like any good distillation, there is a degree of art in how this word cloud has been created – your results might vary.

[6] You can find a volume with all the papers and discussion at: https://www.rba.gov.au/publications/confs/2018/

[7] See, for example, Kaplan, G, B Moll and G Violante (2018), 'Monetary Policy According to HANK', *American Economic Review*, 108(3), pp.697-743.

[8] Rodgers, D and J Hambur (2018), 'The GFC Investment Tax Break', Reserve Bank of Australia Research Discussion Paper 2018-07.

[9] See, for example, Acemoglu, D, S Johnson and J Robinson (2001), 'The Colonial Origins of Comparative Development: An Empirical Investigation', American Economic Review, 91(5), pp.1369-1401.

[10] In this respect I would highly recommend reading Daniel Kahneman's book 'Thinking, fast and slow'.