

CENTRAL BANKING AND FINTECH

A BRAVE NEW WORLD

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In September of last year, I had the opportunity to deliver an address at the Bank of England. I noted at the time that returning to Fleet Street—the heart of London’s financial center—always feels like a journey through history.

In the Middle Ages, that street was an important center of commerce, much of which has now moved online. By the 19th century, the street was home to ticker-tape machines and reporters racing each other to make the evening papers. That world, too, has largely moved online.

Indeed, much has changed for the bankers and policymakers in the City of London and in the rest of the world, not only since the Middle Ages but in the past 20 years. But the changes of the past two decades are only the beginning. Let us spin the hands of Big Ben forward to 2040 to catch a glimpse of the world in our near future. We might see that:

- Cars have disappeared, because people are moving about in hovering drones, or “pods,” which elegantly avoid each other in the morning rush hour.
- One of those pods carries the central bank governor, who recently started her second term. As part of her morning routine, she swipes through a hologram of news videos curated by a digital assistant, before arriving at Threadneedle Street (the location of the Bank of England).

- The governor disembarks, walks up to the columned façade, opens the door and. . .

Who will she encounter inside the building? Are there economists sitting at desks or debating policy choices around a table? Or is there an intelligent machine making decisions, setting rates, and issuing money?

In other words, how will fintech change central banking over the next generation? That is the focus of my remarks today.

In this essay, I would like to consider the possible impact of three innovations—virtual currencies, new models of financial intermediation, and artificial intelligence.

Some of these innovations have already found their way into our wallets, smartphones, and financial systems. But that is only the beginning.

Are you ready to jump onto my pod and explore the future together? As one famed Londoner—Mary Poppins—might have said, bring along a pinch of imagination!

VIRTUAL CURRENCIES

Let us start with virtual currencies. To be clear, this is not about making digital payments in existing currencies through Paypal and other “e-money” providers, such as Alipay in China, or M-Pesa in Kenya.

Virtual currencies are in a different category because they provide their own unit of account and payment systems. These systems allow for peer-to-peer transactions without central clearing-houses, without central banks.

For now, virtual currencies such as Bitcoin pose little or no challenge to the existing order of fiat currencies and central banks. Why? Because they are too volatile, too risky, too energy intensive, and because the underlying technologies are not yet scalable. Many are too opaque for regulators, and some have been hacked.

But many of these are technological challenges that can be addressed over time. Not so long ago, some experts argued that personal computers would never be adopted, and that tablets would only be used as expensive coffee trays. So I think it may not be wise to dismiss virtual currencies.

Better value for money?

For instance, think of countries with weak institutions and unstable national currencies. Instead of adopting the currency of another country—such as the U.S. dollar—some of these economies might see a growing use of virtual currencies. Call it dollarization 2.0.

IMF experience shows that there is a tipping point beyond which coordination around a new currency is exponential. In the Seychelles, for example, dollarization jumped from 20 percent in 2006 to 60 percent in 2008.

So why might citizens hold virtual currencies rather than physical dollars, euros, or sterling? Because it may one day be easier and safer than obtaining paper bills, especially in remote regions and because virtual currencies could actually become more stable.

For instance, they could be issued one-for-one for dollars, or a stable basket of other currencies. Issuance could be fully transparent, governed by a credible, pre-defined rule, an algorithm that could be monitored. . . or even by “smart rule” that reflects changing macroeconomic circumstances.

So in many ways, virtual currencies might just give existing currencies and monetary policy a run for their money. The best response by central bankers is to continue running effective monetary policy, while being open to fresh ideas and new demands, as economies evolve.

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Better payment services?

For example, consider the growing demand for new payment services in countries where the shared, decentralized service economy is taking off.

This is a type of economy rooted in peer-to-peer transactions involving frequent, small-value payments, often across borders.

Four dollars for gardening tips from a lady in New Zealand, three euros for an expert translation of a Japanese poem, 80 pence for a virtual rendering of historic Fleet Street: these payments can be made with credit cards and other forms of e-money, but the charges are relatively high for small-value transactions, especially across borders.

Citizens may one day prefer virtual currencies, since they potentially offer the same cost and convenience as cash—no settlement risks, no clearing delays, no central registration, no intermediary to check accounts and identities. If privately issued virtual currencies remain risky and unstable, citizens may even call on central banks to provide digital forms of legal tender.

So, when the new service economy comes knocking on the Bank of England's door, will policymakers welcome it inside? Offer it tea—and financial liquidity?

NEW MODELS OF FINANCIAL INTERMEDIATION

This brings us to the second leg of our pod journey—new models of financial intermediation.

One possibility is the breakup, or unbundling, of banking services. In the future, we might keep minimal balances for payment services in electronic wallets.

The remaining balances may be kept in mutual funds be invested in peer-to-

peer lending platforms with an edge in big data and artificial intelligence for automatic credit scoring.

This is a world of six-month product development cycles and constant updates, primarily of software, with a huge premium on simple user-interfaces and trusted security. A world where data is king. A world of many new players imposing branch offices.

Some would argue that, if there are fewer bank deposits and money flows into the economy through new channels, it puts a question mark on the fractional banking model we know today.

How would monetary policy be set in this context?

Today's central banks typically affect asset prices through primary dealers, or big banks, to which they provide liquidity at fixed prices—so-called open-market operations. But if these banks were to become less relevant in the new financial world, and demand for central bank balances were to diminish, could monetary policy transmission remain effective?

Central banks may well have to increase the number of counterparties to their operations. The Bank of England is already leading the way by including large broker-dealers and central counterparty clearing houses.

All this, of course, has regulatory implications. More counterparties implies that more firms will fall under the central bank's regulatory umbrella—which is the price to pay for liquidity on a rainy day. Whether the future holds more or less rain is an open question.

The remit of central banks will grow, and with it perhaps, also public scrutiny and political pressure. Independence—at least in setting monetary policy—will need further defending and require clearer communication.

We may also see a shift in regulatory practices. Traditionally, regulators have focused on overseeing well-defined enti-

ties. But as new service providers come on stream in new shapes and forms, fitting them into buckets may not be so easy. Think of a social media company that is offering payment services without managing an active balance sheet. What label should we stick on that?

All this is good for lawyers but not so good for regulators. The regulators will likely have to further expand their focus, from financial entities to financial activities, while possibly also becoming experts in assessing the soundness and security of algorithms. Easier said than done.

Cooperation is key

To make things smoother—at least a bit—we need dialogue. Between experienced regulators and those that are just beginning to tackle fintech. Between policy-makers, investors, and financial services firms. And between countries.

Reaching across borders will be critical as the focus of regulation widens—from national entities to borderless activities, from your local bank branch to quantum-encrypted global transactions.

Because of our global membership of 189 countries, the IMF is an ideal platform for these discussions. Technology knows no borders: what is home? What is host? But how can we avoid regulatory arbitrage and a race to the bottom? This is about the IMF's mandate for economic and financial stability, and about the safety of our global payments and financial infrastructure.

The stakes of—and gains from—cooperation are high. We want no holes in the global financial safety net, however much it gets stretched and reshaped.

I am convinced that the IMF has a strong role to play in this respect. But the Fund will also have to be open to change, from bringing new parties to the table, to considering a role for a digital version of the SDR (Special Drawing Rights).

In other words, the IMF is along for the pod-ride.

ARTIFICIAL INTELLIGENCE

Which brings us to the third and final leg—the transformative effect of artificial intelligence.

Would our governor in 2040 walk into the Bank of England to take instructions from a monetary policy-setting robot powered by artificial intelligence? Even if such an extreme outcome were not to come to pass, how would the widely reported prediction made by Andy Haldane, the Bank's chief economist, of 15 million jobs being automated in the U.K. affect the Bank and its world-class staff?

One thing is clear: we will continue to gather more data about every aspect of the economy and human behavior, which will in turn support the further development of artificial intelligence capabilities. Some estimates suggest that 90 percent of the data available today are generated in the past two years.¹ This is not just information on output, unemployment, and prices, but also behavioral data on the quirks and irrationalities of the *homo economicus*.

Thanks to smartphones and the Internet, these data are now abundant, ubiquitous, and increasingly valuable as we pair them with artificial intelligence.

Artificial intelligence is making immense strides. Over the past year, for example, some of the world's best players of Go, the ancient board game, have lost to a self-learning computer. For many, that day of reckoning was supposed to be decades away. The machine learned tactics, recognized patterns, and optimized its game—better than we could.

Clearly, the economy is vastly more complex than a game of Go. But machines will almost certainly play a larger role over the next generation—in assisting

policymakers, offering real-time forecasts, spotting bubbles, and uncovering complex macro-financial links.

But let me reassure you, humans will still be needed.

For one thing, there is immense uncertainty about the economy. Changes in basic economic relationships need to be spotted and risks evaluated. Judgment and constant questioning by peers, diverse of opinions, and even a few maverick spirits will remain essential to good policymaking. But what if the machine could do that too?

Next is the question of communication. Good monetary policy, as we know, is about story-telling. Policy is effective if only it can be explained clearly so the public can form expectations about future policy. Could machines really explain their decisions in plain English?

Even if that hurdle could be overcome, a last one remains. Even with the best algorithms and machines, targets will be missed, crises will occur, mistakes will be made. Can machines really be held accountable to the young couple unable to buy a house, to the working mother finding herself unemployed?

Accountability is key. Without it, we cannot have independence; how else to bestow so much power on a technocratic organization? And without independence, policy is bound to go astray, as this conference reminds us, loud and clear.

In sum: No, I do not see machines taking over monetary policy. In 2040, the governor walking into the Bank of England and other central banks around the world will be made of flesh and bones, and behind the front door she will find people— at least a few.

CONCLUSION

As our pod journey comes to an end, some of you may wonder about my upbeat tone. For many, this new world of

central banking is less Mary Poppins and more Aldous Huxley—a “brave new world,” much like the one described in Huxley’s famous novel.

I believe that we, as individuals and communities, have the capacity to shape a technological and economic future that works for all. More importantly, we have a responsibility to make this happen.

That is why I prefer Shakespeare’s evocation of the brave new world in *The Tempest*: “O wonder! How many goodly creatures are there here! How beauteous mankind is! O brave new world.”

¹. “Ten Key Marketing Trends for 2017,” available at <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=WRL12345USEN>.