Abstract

Distributed Ledger Technology (DLT), a type of blockchain, refers to a decentralized peer-to-peer network-based transaction ledgers for greater transparency without arbitrating and monitoring central authority. DLT can transform financial markets and payments industries through technology innovation and digital transformation of extant governance structures and processes for transferring digital assets, including bitcoin, in real-time to enable faster efficient payments, clearing, and settlement. While the IS adoption/investment research studied different types of enterprise information systems from the status quo bias theory perspectives, it has not studied DLT investment decisions in government. This research draws on the status quo bias theory to investigate DLT investment decisions to explore the feasibility of DLT in central banking. We found evidence of different types of status quo bias in affecting two of the most influential central banks’ DLT investment decision-making. We explicate their decision characteristics that may explain the observed different types of status quo bias.

Keywords: Blockchain, distributed ledger technology, DLT investment decision making, central banks

Introduction

Distributed ledger technology (DLT), a type of blockchain, is a distributed database maintained over a peer-to-peer network of computers (nodes) to record and transfer digital assets through blockchain (GAO 2014). Once the network nodes validate financial transactions through the smart contract (a computer algorithm-based consensus mechanism), the network nodes share and retain identical, cryptographically secured records, so-called distributed ledgers, in a decentralized manner.

DLT is heralded to revolutionize the industry and drive economic change on a global scale (Lucas 2017). DLT provides the potential for disruptive innovation, for example, in transforming financial value networks through transferring digital assets, including bitcoin, in near-real-time to support payments, clearing, and settlement without the need for a central coordinating governance structure (GAO a 2017; GAO b 2017). Not surprisingly, fintech firms have begun to invest in this new technology for radical and architectural innovations in faster payments and other services (Gomber et al. 2018). Even an economic argument has emerged that the bitcoin standard may become the decentralized alternative to central banking (Ammous 2018). In this dynamic environment of rapid technological change, DLT investment decisions by central banks may have significant structural impacts on governance, regulations, and public policies as well as practical financial and economic impacts on how citizens and banks transact at the national and supranational levels.

Largely due to the newness and uncertainty of DLT, we know little of how influential central banks explore the disruptive innovation space and make DLT investment decisions. This paper aims to examine the extant
Blockchain Investment Decision Making in Central Banks

gap from a status quo bias (SQB) theory perspective. (Samuelson and Zeckhauser 1988, p. 10) have challenged researchers: “We leave to future research the task of identifying the characteristics of decisions that make a strong status quo bias likely.” Therefore, we raise the following research question (RQ):

What are the characteristics of DLT investment decisions that make strong status quo bias effects likely at the organizational decision-making level in the real world?

Specifically, we answer the RQ in the context of DLT investment decisions by advanced economies’ central banks. Methodologically, this study selects two of the global top ten central banks through theoretical sampling and performs a cross-case analysis of the two central banks on their DLT investment decisions. This research advances the theoretical and practical understanding of the status quo bias effects in DLT investment decision making under uncertainty.

The organization of the paper is as follows. Section 2 reviews the literatures. Section 3 describes our methodology. Section 4 presents the study’s key findings on the Reserve Bank of Australia; background information and within-case analysis findings. Section 5 presents the study’s key findings on the US Federal Reserve Bank; background information and within-case analysis findings. By drawing on the SQB theory, Section 6 discusses cross-case analysis insights into the research question, with key concluding remarks.

Literature Review

Blockchain & Distributed Ledger Technologies

In 2009, Bitcoin (the cryptocurrency) introduces the world to Distributed Ledger Technology (DLT), also known as “blockchain”. In essence, DLT enables the update of a chain of networked transactions independently in a decentralized manner through its digital peer-to-peer network platform. In consequence, DLT removes the extant need for central coordination of transactions occurring in real time, with significant implications for the potential to reduce some of the functions performed by central banks around the globe. Here it is important to note that the Bitcoin blockchain is a cryptocurrency application and not the DLT itself. Various cryptocurrencies have sparked interests from central banks, including their own digital currencies such as FedCoin. However, central banks have not progressed much beyond the concepts of their own cryptocurrencies. The National Institute of Standards and Technology (NIST) at the U.S. Department of Commerce considers blockchain as a type of DLT. NIST defines blockchain as “a distributed ledger which is decentralized, peer-to-peer, tamper-evident/resistant, and synchronized through consensus” to “facilitate transactions between mutually-distrusting entities without the need for a trusted arbiter.” (Regenscheid 2017, p. 3).

Since 2009, in a relatively short period, more businesses are accepting cryptocurrency payments, including Bitcoin and Ethereum. It has been predicted that industrial applications and use cases will likely increase because DLT can record not only cryptocurrencies but also other digital assets, such as securities and supply chain transactions. Hence, DLT can redefine near real-time digital transactions by removing the costly and time-consuming back-office processes. This can affect structural change by removing the need for third-party ‘middlemen’ in many transactions (Standards Australia 2017). Similarly, the disruptive potential of DLT exists to shape the future of the financial services in securities post-trading (Pinna and Ruttenberg 2016) and faster payments and inter-bank transfers and settlement (Brühl 2017). DLT embedding trust in decentralized networks has the potential to increase transparency and hence radically change markets and businesses. However, many governance and regulatory issues remain unresolved (Zamani and Giaglis 2018). Furthermore, Risius and Spohrer (2017) conclude that there is a lack of understanding of where and how blockchain is most effectively applied with potential business effects. They show that while prior research has predominantly focused on technological questions of design and features, it has neglected application, value creation, and governance questions.

Status Quo Bias Theory

In a series of decision-making laboratory experiments, (Samuelson and Zeckhauser 1988) showed that decision makers exhibited a “substantial” status quo bias (SQB) across a range of decisions. They define the
status quo bias as the tendency of decision makers to do nothing or maintain their current or previous decision. Their subsequent field studies on investment decisions by employees of Harvard University and faculty members worldwide found “significant” SQB effects in real-world decision making. Namely, the more decision alternatives decision makers face, the stronger is the SQB effect in affecting their rational choice. Similarly, the weaker is their preference for a selected alternative, the stronger is the SQB effect.

(Samuelson and Zeckhauser 1988) identified three main categories to explain the observed SQB effect. The SQB effect may result from (1) rational decision making in the presence of transition cost and/or uncertainty; (2) cognitive misperception; and (3) psychological commitment that arises from misperceived sunk costs, regret avoidance, or a drive for consistency. **Table 1** lists the three categories of reasons that may explain extant SQB in the individual decision maker or the organization.

<table>
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<tr>
<th>Explanations</th>
<th>Definition</th>
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<tr>
<td><strong>Rational decision making with transition costs and/or uncertainty (in the subsequent decisions)</strong></td>
<td>Transition costs refer to the cost of switching from the status quo to an alternative. Transition costs support the SQB when transition costs exceed the expected efficiency gain achieved through an appropriation of a superior alternative.</td>
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<td>Status quo inertia in the presence of transition costs is consistent with rational decision making.</td>
<td>In real decision situations, the set of possible choice alternatives is unknown. Decision makers must incur transaction costs (the cost of search and the cost of analysis) to discover the best choice alternatives.</td>
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<td>Cognitive Misperception</td>
<td>Loss aversion refers to the tendency of individuals to weigh losses heavier than gains in making decisions.</td>
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<td>Loss aversion biases the decision maker to favor the status quo. Taking the status quo as the reference point, he/she weights potential losses from switching as greater than potential gains (so-called the endowment effect). The strength of the SQB depends on gain/loss framing effects.</td>
<td>Loss aversion refers to the tendency of individuals to weigh losses heavier than gains in making decisions.</td>
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<tr>
<td>Due to bounded rationality, the decision maker (or the analyst) undertakes a partial analysis of possible alternatives.</td>
<td>Partial analysis of a subset of alternative superior technology functions and features (ignoring the others that may not be currently available under the existing system) may provide the status quo option a decision advantage.</td>
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<tr>
<td>Psychological Commitment</td>
<td>Sunk costs refer to previously invested money, time, and efforts associated with the status quo alternative.</td>
</tr>
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<td>The presence of sunk costs or other resource investments sustains the SQB in subsequent decision making. The strength of the SQB is influenced by the level of resource investments.</td>
<td>Regret avoidance refers to the tendency of the individual to avoid regrettable consequences of previous decisions.</td>
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<td>Regret avoidance sustains the SQB in sequential decision making.</td>
<td>Samuelson and Zeckhauser (1988, p. 38) explain that avoidance of decision regret “favors adherence to status quo norms or routine behavior at the expense of innovation, and it reinforces to the individual’s inclination to conform to social norms”.</td>
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<tr>
<td>The decision maker’s drive for consistency supports the SQB in subsequent decision making.</td>
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**Table 1. Explaining the Status Quo Bias**

The status quo theory (Samuelson and Zeckhauser 1988) has influenced research on important real decisions. IS research from SQB theory/perspective has focused on understanding user resistance to new IS implementations. The IS literature found extensive evidence for the status quo bias effect both in experiments and survey research studies. For instance, an early IS survey research found the central role of transition costs in terms of switching costs in increasing user resistance to an IS implementation. Moreover, switching costs also mediate the relationship between other antecedents (colleague opinion and self-efficacy for a change) and user resistance to IS implementation (Kim and Kankanhalli 2009). Diverse types
of enterprise information systems were examined from SQB theory. They include enterprise resource planning (ERP) systems (Fan et al. 2015; Kim 2011; Mills et al. 2016), agile information systems (Hong et al. 2011), knowledge management systems (KMS) (Li et al. 2016), product configuration systems (Mandl et al. 2011), health services (Hsieh 2015; Zhang et al. 2017), and mobile phone (Khedhaouria et al. 2016).

A meta-analysis of 34 studies found strong evidence for the SQB effect on IS adoption decisions (Wu 2016). Moreover, it also found that the type of adoption, the type of focal system, and the type of institutional pressures explained the substantial variability in SQB effect sizes. Another meta-analysis of IS research on user resistance to new IS use from a status quo bias theory perspectives found that while many prior research studies primarily focused on a rational cost–benefit analysis (e.g., switching costs/benefits), very few studies analyzed the SQB effect in human decision-making that stems from bounded rationality (Lee and Joshi 2017). Finally, a review of innovation adoption decisions using the status quo bias theory (Burmeister and Schade 2007) suggests a clear lack of empirical studies on disruptive technology investment decisions involving blockchain or DLT from SQB theory perspectives.

**Methodology**

**Case Study Research through Theoretical Sampling**

The DLT investment decision-making phenomenon is very new. Eisenhardt (1989, p. 537) recommends case study research through theoretical sampling to explore a new phenomenon. The goal of theoretical sampling is to select cases that are likely to replicate or extend the theory. We selected two influential central banks, in Australia and the United States, out of 35 countries all of which are participating members of International Organization for Standardization (ISO) Standing Committee on ISO/TC 307 Blockchain and Distributed Ledger Technologies (International Organization for Standardization 2016), since they are more advanced in the exploration and exploitation of DLT than non-participating countries. Moreover, both the Australian Reserve Bank (ARB) and the U.S. Federal Reserve Bank (FRB) are globally influential using three measures of the central bank’s global influence. The measures are the total valuation of assets the central banks held in 2016 (Bank for International Settlements 2016), rankings from Caproasia’s most Influential Central Banks in the World by GDP in 2015, and Global Finance’s annual survey of the monetary policy report card in 2017. Table 2 shows our theoretical sample with measures of global influence.

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<tr>
<td>Australia <a href="https://www.rba.gov.au/">https://www.rba.gov.au/</a></td>
<td>Reserve Bank of Australia (RBA)</td>
<td>3,007.8</td>
<td>10</td>
<td>A</td>
</tr>
<tr>
<td>United States <a href="https://www.federalreserve.gov/">https://www.federalreserve.gov/</a></td>
<td>Federal Reserve Bank (FRB)</td>
<td>14,816.5</td>
<td>1</td>
<td>A</td>
</tr>
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**Table 2. Theoretical Sample**

Our secondary data sources, collected from the central banks’ websites, consisted of technical reports on blockchain and DLT, strategic planning, extant IS, and innovation, annual reports, and public speeches delivered by central bank governors and other senior executives. Other secondary data on blockchain and DLT news releases related to the two central banks came from bitcoin/blockchain/DLT specialized websites. We drew on status quo bias theory (Samuelson and Zeckhauser 1988) to conduct thematic analyses for each of the two central banks on their DLT investment decisions. This was followed by a cross-case thematic analysis to answer our research question.

**Reserve Bank of Australia**

The Reserve Bank of Australia (RBA) serves as the central bank in accordance with the Reserve Bank Act of 1959. The RBA is a monetary policy-making body which maintains a strong financial system for the
citizens of Australia. The RBA does this by setting the cash rate to meet optimal inflation targets, maintain an efficient payment system, and issue Australian banknotes. The RBA also provides registry and banking services for other central banks around the world. The governance structure of the RBA includes the Reserve Bank Board and the Payments System Board. The responsibility of the latter includes the RBA's payments system policy and, importantly the promotion of efficient and competitive payment systems and the overall control for risks in the financial system. The RBA Payment infrastructure is one of the key functions of the RBA and extant payments system is one of its strategic information systems to support the RBA core business.

The RBA has been investigating the potential use of bitcoin and a broader DLT since 2013 (Richards 2018). The Reserve Bank of Australia Annual Report (2018, p. 36) states: Bank staff closely follow developments in new technologies, including distributed ledger technology, digital currencies and payments-related financial technology (or fintech) more broadly. In stark contrast to some of the advanced economies’ central banks such as Bank of Canada, Bank of Japan, and European Bank, all of which decided to conduct a series of DLT proof-of-concept projects, the RBA has not been convinced that “it (bitcoin and a broader DLT) has a use” (Eyers 2018). We draw on the SQB theory to try to explain the RBA’s DLT investment decision in this section, which would follow by the within-case findings of the FRB.

**Status Quo Inertia in the Presence of Sunk Costs and Transition Costs**

Sunk costs refer to previously invested money, time, and efforts associated with the status quo alternative (Samuelson and Zeckhauser 1988). In the presence of sunk costs, the strength of the SQB effect tends to be influenced by the level of resource investments the individual or the organization has made previously.

The RBA announced Strategic Review of Innovation in the Payments System in May 2010 to identify possible gaps in the RBA’s payments system. The Payments System Board released a report entitled, Strategic Review of Innovation in the Payments System: Conclusions, in June 2012 to recommend the RBA’s new capability in providing real-time payment (Payments System Board 2014). In response to the 2012 report by the Payments System Board, the RBA played a significant role in developing the New Payments Platform (NPP), which the RBA co-owns with 12 retail banks. NPP Australia which operates the NPP launched it to the public in February 2018, as an open-access digital platform infrastructure for fast payments in Australia. Figure 1 shows the NPP, with over 2 million PayIDs registered post-launch.

The NPP enables customers of financial institutions to make real-time payments available 24 hours a day for 7 days a week. In 2014, on average, Direct Entry (DE) payments by households, business and governments were $56 billion per business day. In conjunction with the NPP, the RBA built new infrastructure, the Fast Settlement Service (FSS), as a new service of the Reserve Bank Information and Transfer System (RITS). The FSS transaction volume reached over 100,000 per day, having settled a total of 19.4 million interbank transactions with a total value of $15.1 billion as of August 2018 (Reserve Bank of...
Australia, 2018). The real-time settlement of NPP payments in central bank funds enables participating retail banks to make funds available in recipients’ accounts instantaneously without settlement or credit risk, and hence co-creating business value for the payments industry. Although the public launch of the NPP experienced a significant 2-year delay, the RBA considers the NPP and the FSS as significant radical changes made to the Australian payments system and as the positive outcomes of collaborative innovation between the central bank and the payments industry.

Although the NPP has not explored DLT, it is widely viewed as the critical first step towards future DLT-based collaborative innovations. However, the sunk costs associated with the NPP and the FSS would be significantly high for the RBA particularly due to its significant delay of the NPP launch to the public. As for transition costs which are defined as the cost of switching from the status quo to an alternative, the RBA’s switching costs from the NPP to an alternative next-step DLT-based payments system would be too prohibitively high as of 2018.

**Status Quo Inertia in the Presence of Cognitive Misperception**

Cognitive misperception refers to the tendency of the decision maker to conduct a partial analysis of a subset of alternatives. This means in this paper a partial analysis of superior technology functions and features that may ignore the others that are not currently available under the existing system. This partial analysis may provide the status quo option as a decision advantage.

Other influential central banks, such as the Bank of Canada (BOC), have viewed risky bitcoin applications and DLT, a broader technology, as being separate. For example, the governor of the BOC pronounced DLT “as a genius technology” but bitcoin “as a gamble.” In other words, the BOC has decoupled DLT from the controversial bitcoin. Moreover, Commonwealth Bank of Australia (CBA) and Wells Fargo in the U.S. launched real-world blockchain applications to reduce transaction costs in trade finance in November 2016. CBA is not only Australia’s largest retail bank but also one of the twelve retail banks that co-own the NPP. In this dynamically changing landscape of DLT, some of the influential central banks conducted comprehensive analysis through investments in a series of DLT proof-of-concept (POC) projects. A POC project aims to determine the feasibility of the promising but uncertain technology would function in the real world as envisioned. In stark contrast, the RBA decided not to conduct a DLT POC and limited their analysis to the risk of bitcoin.

Tony Richards (the Head of Payments Policy Department) discussed in a speech on the challenges cryptocurrencies had faced and why the RBA would not likely seek its. Mr. Richards stated that after nine years after its launch, bitcoin continues to have structural flaws that make it unsuitable for many uses, many of which stem from its inefficient verification process (Richards 2018). In reinforcing the Richards statement, The Assistant Governor of the RBA, Mr. Eyers, issued a statement that he is “interested to consider what frictions these technologies are designed to address [but] in many cases I just don’t see what the point is” and that “I’m not convinced that it has a use” (Eyers 2018). Furthermore, the Governor of RBA, Dr. Philip Lowe, was skeptical about the potential of a DLT-based settlement system and concluded:

It is possible that the RBA might, in time, issue a new form of digital money – a variation on exchange settlement accounts – perhaps using distributed ledger technology. This money could then be used in specific settlement systems. The case for doing this has not yet been established, but we are open to the idea (Reserve Bank of Australia - Philip Lowe 2017).

We need to better understand the potential efficiencies for private business and why it would be preferable for such a settlement system to be provided by the central bank, rather than the private sector; why privately issued tokens or files could not do the job. We would also need to understand
whether and how risk in the financial system would change as a result of such a system. It remains unclear which way this could go (Reserve Bank of Australia - Philip Lowe 2017c).

Federal Reserve Bank

The Federal Reserve Bank (FRB) is the US central bank established in 1913. The FRB resembles a system rather than a single central bank such as the RBA. The Federal Reserve system consists of the Federal Reserve Board of Governors, the 12 Reserve Banks, and the Federal Open Market Committee (FOMC). The FRB’s five main responsibilities are to conduct the nation’s monetary policy, promote the stability of the financial system, promote the safety and soundness of individual financial institutions, foster efficiency in payment and settlement safety systems, and promote community development and consumer protection. Importantly, the payment system is one of the key functions of the FRB and extremely vital to the health of the U.S. financial system.

The FRB launched the Faster Payments Task Force in May 2015 to identify the goals and attributes of effective and safe faster payments systems. The Task Force was to assess the potential use of DLT by the FRB. In January 2015, Dr. David Andolfatto, Senior Vice President, Research Division of FRB of St. Louis, spoke at the International Workshop on P2P Financial Systems conference and endorsed the idea of creating the FRB’s own cryptocurrency. Although Janet Yellen, the Fed chair at the time, never formally endorsed the idea, there was still speculation that this could be a possibility. The Capability Showcase is a part of the initiatives from the Faster Payments Task Force to promote innovative payments system capabilities where many solution providers as well as the public to contribute toward the faster payments system. In December of 2016, the FRB published the “Distributed Ledger Technology in Payments, Clearing, and Settlement” which examined financial trading as well as blockchain payment solutions.

In the “Faster Payments Task Force Report One”, they discussed the overview of the Faster Payments Task Force objectives and processes, as well as the U.S. payments landscape, and the benefits of real-time faster payments. This includes why the payments industry and consumers are demanding a faster and safer payments system now, with the proposed technology solutions submitted from 16 different organizations (Faster Payments Task Force, 2017b). Despite the existing market demands and technology innovations in payments, however, the FRB decided not to actively explore these 16 proposed alternative payments solutions.

Status Quo Inertia in the Presence of Loss Aversion

The FRB’s loss aversion seems to have upheld the status quo by not having actively explored the feasibility of any of the 16 innovative solution alternatives submitted to the Faster Payments Task Force. Loss aversion refers to the tendency of individuals to weigh losses heavier than gains in making decisions. Taking the status quo as the reference point, the FRB may have calculated potential losses from switching as greater than potential gains (so-called the endowment effect). The strength of the SQB depends on gain/loss framing effects. Like the RBA, the FRB has undertaken a partial analysis of possible alternatives through the Faster Payments Task Force (Faster Payments Task Force, 2017a).

The extant FRB Payments System processes approximately 600 million transactions per day, with a value of $12.6 trillion U.S. dollars (Mills et al. 2016). The driving force behind DLT-based payments clearing and settlement is that DLT will reduce or even eliminate operational and financial inefficiencies of storing, recording, and transferring digital assets in financial markets (Mills et al. 2016). Unlike many other countries, the U.S. has a bank-centric payments system, with many participants with decades-old infrastructure. A new DLT-based payments system, if built, would be required to operate with these older legacy systems, with costly investments required for radical improvements in speed, security, efficiency, cross-border payments, and industry collaboration (Faster Payments Task Force, 2017a). However, unlike many other countries that have a real-time payments system, the U.S. does not have a single central authority to mandate standards and improvements across the industry (Faster Payment Task Force, 2017a). Several regulators, including the FRB, the Office of the Comptroller of the Currency, the Federal Deposit
Insurance Corporation, the National Credit Union Administration, and state-level regulatory agencies are involved (GAO 2018). All these factors seem to contribute to perceived greater losses related to the DLT-based payments system alternative and the tendency to remain with the status quo.

The FRB’s loss aversion was expressed by the FRB chair, Jerome Powell, regarding a DLT-based payments system alternative. He underscored likely losses than gains: “at least for now, in payment, clearing, and settlement, safety and confidence must also weigh in the balance.” It’s also important to note that firms are still grappling with the business case for upgrading and streamlining payment, clearing, settlement, and related functions with DLT. Because upgrades are too costly, lengthy, and risky, particularly if the technology is still being proven, as is the case for DLT. We will also likely see issues with governance and risk as well as the legal foundation to deploy DLT with regard to the transfer of assets under existing legal frameworks” (Powell 2017).

In addition, the FRB chair also signaled his loss aversion in terms of implementation issues involving a highly regulated and decentralized payments system:

“...it will be important to keep these challenges firmly in mind as we move beyond experimentation and into the development and deployment of new products and processes.” (Powell 2017, p. 10).

Finally, Mr. Powell more forcefully expresses the FRB’s loss aversion to public value failure when he stated: “...we should be open to the new ideas and innovations that will drive economic growth and improvements in our financial system. At the same time, the public rightfully expects that authorities will do whatever it takes to keep their money safe (Powell 2017, p. 10).”

Discussion and Conclusion

This research was motivated by the gaps in the IS literature on DLT investment decisions that would impact the industry and its value chain. Specifically, largely due to the newness and uncertainty of DLT, we know little of how influential central banks explore the disruptive innovation space and make DLT investment decisions. Hence, this research examined the research question: What are the characteristics of DLT investment decisions that make strong status quo bias effects likely at the organizational decision-making level in the real-world? We conducted a cross-case analysis and comparison of the two central banks’ DLT investment decisions with the potential for DLT-based payments system alternative to extant payments system. We examined the characteristics of DLT investment decisions by the two of the global top ten influential central banks and participating members of ISO/TC 307 on blockchain and DLT.

Overall, our analysis shows that there is no imminent future full deployment of DLT-based platforms for the central banking core functions in high-volume and high-value payments, clearing, and settlement. Our case analysis of both central banks supports the utility of the SQB theory in the new type of disruptive technology which the IS literature has not investigated from the status quo bias theory perspectives. Similar to the IS literature, the RBA has displayed strong status quo bias towards the New Payments Platform (NPP) which the RBA co-owns with 12 retail banks and the FSS it developed in conjunction with the NPP. With the RBA’s enormous sunk costs from the significantly delayed public launch of the NPP and the development of the FSS, the RBA decided not to explore the potential of DLT as a (possibly) superior payments system for the payments industry, through the investment in any DLT proof-of-concept project. Organizations invest in proof-of-concept projects when the technology is promising but still uncertain whether or how it works in their unique business environment or complex ecosystem. In the case of the RBA, transitions costs would be very high, if it decides to switch to an alternative DLT-based payments system, from the NPP and the FSS both of which are still new to the public. While the FRB showed evidence of status quo bias due to its loss aversion and signaled its worries about this type of radical change for consumers. Essentially, both central banks noted that there was too much risk for them to pursue DLT at this time, effectively arguing that the status quo was the right path.

Our analysis revealed that the payments industry and consumer payment patterns changed largely due to the increased digitization of society; both central banks realized the urgent need to transform and
modernize the existing inefficient payments system starting with RBA in 2012 and FRB in 2015. In Australia, the RBA invested in the development of NPP with 12 retail banks. The RBA delayed the scheduled 2016 public launch of the NPP by two years. In conjunction with the NPP, the RBA by itself invested in the development of FSS. In February 2018, the RBA finally launched these two systems. The RBA decision makers’ public speeches and statements made on bitcoin and DLT in 2017 cannot ignore their prior investment decisions to commit the resources for the development of the NPP. The RBA faces the challenge of whether or how to switch to the potentially superior but still unknown DLT.

Similarly, in the US, the FRB faces the same decision challenge regarding the potential of DLT but in a different circumstance: no single modernized payments system for the payments industry and households. Both of our case studies confirm the existence of severe resistance to change and confirmation of SQB theory.

The noted challenges are similar for both countries; the key strategic risk challenge in moving from highly complex centralized payments systems to new near-real-time payments platforms, and to DLT-based highly decentralized autonomous networks without a central control mechanism. The technological uncertainty, issues of security and privacy, and the leadership challenge characterized by these central banks may explain SQB theory with which these central banks are adopting DLT innovations in comparison to fintech firms that embraced blockchain and DLT more fully (Gomber et al. 2018). In this regard, our case analysis results show that the governance challenges facing the two central banks are consistent with prior research on DLT-based innovation challenges in the different research contexts (Brühl 2017). Both Australia and the US highly regulate and centralize banking systems, which may further stifle DLT-based innovations.

On the one hand, our study makes theoretical and empirical contributions to the literature by applying SQB theory to investigate SQB effects on DLT investment decision making in the central banking context. While the IS literature studied SQB effects on enterprise-level information systems, central banks’ payment systems and clearing systems are far more complex in the scope and scale, as they operate in real time at the national and supranational levels. On the other hand, there are some limitations to this study. First, we compared only two influential central banks in Australia and the US. However, many other countries are currently experimenting with DLT and payments systems. Second, we relied on secondary data without conducting field case study interviews with those involved with these DLT projects. From these limitations, our future research directions include field case studies where we can further investigate other central banks and their stages of DLT exploration and exploitation.

REFERENCES


International Organization for Standardization. 2016. "Blockchain and Distributed Ledger Technologies."


