

ICMA Brief:

Regulatory approaches to FinTech and innovation in capital markets

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Introduction

The rise of FinTech¹ has sparked increasing interest from financial regulators. Applications of distributed ledger technology, machine learning, big data analytics or cloud computing, to name a few, have significant potential to alter business models and impact the functioning of financial markets. In response, financial regulators have adopted different approaches to address FinTech and innovation in their respective jurisdictions.

The purpose of this paper is to provide an overview of financial regulators' approaches to FinTech, identify relevant use cases for capital markets, notably cross-border debt capital markets, and provide a sense of the direction of travel. The paper is based on publicly available information and covers selected regulatory initiatives across 26 jurisdictions within Europe, Asia and North America.

Relevant publications on FinTech and regulation

Within the last 18 months, a number of research papers and reports have been published by public sector organisations on this topic. These include notably the BCBS report [Sound Practices – The implications of fintech developments for banks and bank supervisors](#) (February 2018), the FSB's [Financial Stability Implications from FinTech: Supervisory and regulatory issues that merit authorities attention](#) (June 2017), the [IOSCO Research Report on Financial Technologies \(FinTech\)](#) (February 2017), the [EBA's Discussion paper on its approach to financial technology \(FinTech\)](#) (August 2017)², the [IADB's Discussion Paper on Regulatory Sandboxes in Latin America and the Caribbean for the FinTech Ecosystem and the Financial System](#) (March 2018), and the FCA's [Regulatory sandbox lessons learned report](#) (October 2017).

Categories of regulatory innovation facilitation schemes

From these publications, and a review of publicly accessible information, it becomes apparent that schemes put in place by financial regulators to support innovation vary both in form and substance. One of the reasons is that financial regulatory authorities' mandates can differ significantly from one jurisdiction to another. While market integrity, financial stability, investor and/or consumer protection are common objectives of financial regulators, some also have a mandate to support innovation, or promote its jurisdiction's financial industry, for instance. Regulators' approaches to innovation in financial

¹ FinTech, a term broadly used to describe innovation in financial services enabled by technology.

² From p. 32-33.

markets therefore reflect diverging remits, on the one hand, but also a trade-off between competing objectives within their mandate, on the other.

Some regulators have set up, for example, FinTech “contact points”, “innovation hubs”, “channels”, or “labs”, while the concept of a regulatory sandbox has gained wider traction since it was initially introduced by the UK FCA in 2016. Despite these differences in terms of terminology and mission, the various regulatory initiatives can be broadly split into three different categories according to the above-mentioned BCBS report: (i) innovation hubs, (ii) accelerators, and (iii) regulatory sandboxes.

A shared objective of each initiative is to provide regulatory guidance to innovative firms, including both start-ups and incumbent firms. At the same time, it provides regulators and supervisors with an opportunity to gain insights into innovative technology, enhance their understanding of the risks and opportunities of FinTech, and adapt the regulatory framework if necessary. However, the precise level of guidance and support is dependent on the individual supervisory or regulatory authority, its mandate and the regulatory framework. According to the BCBS’s classification, the three types of innovation facilitation regimes can be defined as follows³:

- (i) **Innovation hubs** are more informal structures “set up by supervisory agencies that provide support, advice or guidance to regulated or unregulated firms in navigating the regulatory framework or identifying supervisory policy or legal issues and concerns.”
- (ii) **Accelerators** are “partnership arrangements between fintech providers and central banks/supervisory agencies to develop use cases that may involve funding support and/or authorities’ endorsement/approval for future use in central banking operations or in the conduct of supervisory tasks.”
- (iii) **Regulatory sandboxes** are “controlled testing environments, sometimes featuring regulatory forbearance and alleviation through the use of legally provided discretions by the supervisory agency. The testing environment may involve limits or parameters within which the firms must operate (eg restrictions on the time a firm may operate in the sandbox).”

Selected innovation facilitation schemes across 26 jurisdictions in Europe, Asia and North America

Building on the BCBS-FSB survey framework⁴, and additional research⁵, which is *not* part of the BCBS-FSB survey, the below table provides an overview of FinTech regulatory approaches in 26 jurisdictions across Europe, Asia and North America. It includes the names of relevant regulatory authorities as well as links to the respective innovation support schemes. Contact details, and in some cases, frequently asked questions and answers related to applicable regulation to FinTech, can be found on the respective regulator’s website.

The information provided below has been compiled on a best efforts basis, but is by no means exhaustive. The innovation facilitation scheme in each jurisdiction has been classified as belonging to one of the three above mentioned categories based on the BCBS report and/or a review of publicly available information on respective regulators’ websites. Since a number of initiatives have been announced but not yet implemented, relevant legislative initiatives which aim to support innovation from a regulatory perspective have also been included.

³ BCBS (2018): Sound Practices, Implications of fintech developments for banks and bank supervisors. p. 43 (<https://www.bis.org/bcbs/publ/d431.htm>).

⁴ Ibid. See Graph 10: Jurisdictions’ initiatives to facilitate innovation, p.40

⁵ Notably on Austria, Canada, Denmark, the EU, Finland, Ireland, New Zealand, Norway, Mexico, Spain, Sweden, and the US.

Table 1: Innovation facilitation schemes in the EU/EAA and non-EEA countries

EU/EEA and non-EEA				
Jurisdiction	Regulatory authority	Innovation Hub	Accelerator	Regulatory sandbox
Austria	Finanzmarktaufsicht (FMA)	FMA FinTech Point of Contact (in German) FMA FinTech Navigator (in German)		
Belgium	National Bank of Belgium (NBB) Financial Services and Markets Authority (FMSA)	NBB Contact Point for FinTech FMSA FinTech Contact Point		
Denmark	Financial Supervisory Authority (FSA) [Finanstilsynet]	FSA FinTech Unit FSA FinTech Forum		FSA FT Lab
Finland	Financial Supervisory Authority (FSA) [Finanssivalvonta]	FSA Innovation HelpDesk		
France	Autorité des Marchés Financiers (AMF) Autorité de contrôle prudentiel et de résolution (ACPR) - Banque de France	AMF FinTech, Innovation and Competitiveness division (in French) ACPR Fintech-Innovation Unit (in French)	Le Lab Banque de France (in French)	
Germany	Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin)	BaFin FinTech (in German)		
Italy	Bank of Italy (BOI) Commissione Nazionale per le Società e la Borsa (CONSOB)	BOI FinTech Channel		
Ireland	Central Bank of Ireland (CBI)	CBI Innovation Hub		
Luxembourg	Commission de surveillance du secteur financier (CSSF)	CSSF Fintech (in French)		
Netherlands	Authority for the Financial Markets (AFM) De Nederlandsche Bank (DNB)	AFM & DNB Innovation Hub		AFM & DNB Regulatory sandbox
Norway	Finanstilsynet	<i>Note: Information on Finanstilsynet's approach to FinTech can be found in a presentation given at Finance Norway's Capital Markets Day on 6 April 2018.</i>		<i>Note: Norwegian legislators have requested the creation of a FinTech regulatory sandbox by the end of 2019, according to media reports.</i>
Poland	Polish Financial Supervision Authority [Komisja Nadzoru Finansowego, KNF]	KNF Innovation Hub Programme		

Jurisdiction	Regulatory authority	Innovation Hub	Accelerator	Regulatory sandbox
Spain	National Securities Market Commission [Comisión Nacional del Mercado de Valores, CNMV]	CNMV FinTech / Innovation Portal		
Sweden	Finansinspektionen (FI)	FI Fintech Innovation Centre		
Switzerland	Swiss Financial Market Supervisory Authority [Eidgenössische Finanzmarktaufsicht, FINMA]	FINMA FinTech		FINMA FinTech
UK	Financial Conduct Authority (FCA) Bank of England (BoE)	FCA Project Innovate BoE FinTech Hub	BoE FinTech Accelerator	FCA Regulatory sandbox Global Financial Innovation Network (GFIN; announced on 7 August 2018) ⁶
EU	European Central Bank (ECB)	ECB Guide to assessments of fintech credit institution licence applications (22 March 2018)		
	European Securities and Markets Authority (ESMA)	ESMA Innovation & Products ESMA Financial Innovation Day (for regulators) ESMA Financial Innovation Standing Committee		
	European Commission (EC)	EC legislative and non-legislative initiatives related to FinTech including the EC's FinTech Action Plan (8 March 2018)		<i>Note: As set out in the EC's FinTech Action Plan, the Commission will present a report with best practices for regulatory sandboxes by Q1 2019, amongst other measures.</i>

Sources: BCBS-FSB, *Sound Practices: Implications of fintech developments for banks and bank supervisors*. p. 43; Additional research.

⁶ The FCA has, in collaboration with 11 financial regulators and related organisations, announced on 7 August 2018 the creation of the Global Financial Innovation Network (GFIN), building on the FCA's proposal earlier this year to create a 'global sandbox' (<https://www.fca.org.uk/news/press-releases/fca-collaborates-new-consultation-explore-opportunities-global-financial-innovation-network>).

Table 2: Innovation facilitation schemes in Asia-Pacific

Asia-Pacific				
Jurisdiction	Regulatory authority	Innovation Hub	Accelerator	Regulatory sandbox
Australia	Australian Securities & Investments Commission (ASIC)	ASIC Innovation Hub	ASIC Innovation Hub ASIC's Regtech Liaison Forum	ASIC Regulatory Sandbox
Hong Kong SAR	Hong Kong Monetary Authority (HKMA) Securities and Futures Commission (SFC)	HKMA FinTech Facilitation Office SFC Fintech Contact Point	HKMA FinTech Facilitation Office	HKMA Fintech Supervisory Sandbox (FSS) SFC Regulatory Sandbox
Japan	Bank of Japan (BoJ) Financial Services Agency (FSA)	BoJ FinTech Center FSA FinTech Support Desk		FinTech Proof-of-Concept (PoC) Hub (referred to in the FSA's Weekly Review No. 305 , 30 July – 3 August 2018). For further information in English, see FSA presentation to the IMF , slide 8 (26 April 2018).
Korea	Financial Services Commission (FSC)	FSC Financial Innovation Bureau		[No information available in English]
Singapore	Monetary Authority of Singapore (MAS)	MAS Fintech Office , part of the Smart Financial Centre initiative	MAS Financial Sector Technology and Innovation (FSTI) - Proof of Concept(POC) scheme	MAS FinTech Regulatory Sandbox
New Zealand	Financial Markets Authority (FMA)	FMA Market Innovation		

Sources: BCBS-FSB, *Sound Practices: Implications of fintech developments for banks and bank supervisors*. p. 43; Additional research.

Table 3: Innovation facilitation schemes in North America

North America				
Jurisdiction	Regulatory authority	Innovation Hub	Accelerator	Regulatory sandbox
Canada	Canadian Securities Administrators (CSA) Autorités canadiennes en valeurs mobilières (ACVM)	CSA/ACVM Regulatory Sandbox Contact through Canada’s provincial and territorial securities regulators		CSA/ACVM Regulatory Sandbox
Mexico	National Banking and Securities Commission (Comisión Nacional Bancaria y de Valores, CNBV) Central Bank of Mexico (Banco de México, Banxico)			<i>Note: CNBV will be adopting regulatory measures from September 2018 to implement the so-called FinTech Law⁷ which took effect on 10 March 2018. It introduces a comprehensive regulatory framework for FinTech firms, including a regulatory sandbox.⁸</i>
USA	Commodity Futures Trading Commission (CFTC)	Lab CFTC Lab CFTC GuidePoint	Lab CFTC CFTC 2.0	
	Securities and Exchange Commission (SEC)	SEC FinTech		
	US Department of the Treasury - Office of the Comptroller of the Currency (OCC)	OCC Office of Innovation		<i>Note: The US Department of the Treasury issued a recommendation in July 2018 to establish a regulatory sandbox at federal level.⁹</i>

Sources: BCBS-FSB, *Sound Practices: Implications of fintech developments for banks and bank supervisors*. p. 43; Additional research.

⁷ Comisión Nacional Bancaria y de Valores, Press release, 4 July 2018 (<https://www.gob.mx/cnbv/prensa/43-2018-nuevas-actividades-reservadas-contempladas-en-la-ley-para-regular-las-instituciones-de-tecnologia-financiera-ley-fintech#acciones>)

⁸ Other measures cover crowdfunding, cryptocurrency transactions, application programming interfaces (APIs), and automated investment advice (robo advisors). White & Case Technology Newsflash, 14 March 2018 (<https://www.whitecase.com/publications/alert/mexican-fintech-law-becomes-effective>)

⁹ See US Department of the Treasury (July 2018), *A Financial System That Creates Economic Opportunities: Nonbanks Financials, Fintech, and Innovation*, pp. 167-168 (<https://home.treasury.gov/sites/default/files/2018-07/A-Financial-System-that-Creates-Economic-Opportunities---Nonbank-Financi...pdf>). *Note:* In response to the publication of this report, New York State issued a [statement](#) on 31 July 2018 rejecting the concept of regulatory sandboxes. In contrast, on 6 August 2018, the State of Arizona [adopted legislation](#) to establish a Fintech regulatory sandbox at state level, which is “likely [to] be active and ready to accept applications by late 2018”.

Generally, it can be observed that a dedicated FinTech unit or “innovation hub” has been set up in the majority of the 26 jurisdictions referenced above, while “accelerators” have been put in place in a few selected jurisdictions only. However, the concept of a regulatory sandbox, coined and introduced by the UK FCA in 2016, has gained wider traction globally. From the 26 jurisdictions, at least 7 jurisdictions have set up an operational regulatory sandbox framework, while others have announced plans to create such a framework.

Most initiatives have been set up within the last two years, with the exception of the FCA’s Project Innovate in particular (set up in 2014), and other financial regulators in the APAC region. On an international level, the creation of a Global Financial Innovation Network (GFIN) was announced by the UK FCA on 7 August 2018 in collaboration with 11 financial regulators and other interested parties. This initiative follows on from the UK FCA’s proposal for a “global sandbox” in February 2018.¹⁰ A consultation is open until 14 October 2018.

Regulatory sandboxes: Sectors and use cases

With respect to regulatory sandboxes, the level of available information on the firms admitted, business areas and use cases varies between regulators. Below are selected examples:

- (i) **UK:** The FCA introduced Project Innovate in October 2014. Following the publication of a [report](#) in November 2015, the FCA regulatory sandbox became operational in May 2016. Since then, around 100 firms have been admitted in groups or “cohorts” on a semi-annual basis. A list of the firms and brief descriptions are available on the FCA’s [website](#).
- To date, a majority of innovative solutions tested has focused on retail banking, payments, insurance, and a range of other areas (eg identity verification; RegTech). DLT has been one of the most popular technologies, followed by other technologies including AI/machine learning.
 - While most firms are start-ups, incumbents admitted to the FCA’s sandbox include HSBC (retail banking), Lloyds (retail banking) in 2016; Barclays (RegTech), Nationwide (investment advice) in 2017; and Natwest (DLT based governance model) in 2018.
 - **The number of Fintech applications for capital markets has increased markedly**, the focus being on DLT, and more recently, digital assets. The initial target market appear to be small or medium-sized issuers, focusing on tokenisation of debt, and lifecycle management: [Nivaaura](#) (Cohort 1&2); [BlockEx](#) (Cohort 2&4); [Capexmove](#), [Fineqia](#); [Globacap](#) (all in Cohort 4).
 - Innovative solutions for equity markets have been tested by firms including [Square Book](#) (Cohort 3); [20|30](#); and [Token Market](#) (both in Cohort 4).

In addition, the FCA released a [regulatory sandbox lessons learned report](#) in October 2017 which covers the first two testing phases. In terms of market impact, the report concludes that “it is too early to draw robust conclusions”, even less so for capital markets given the limited number of relevant trials during that period. The same remains to be seen with regard to cohorts 3 and 4, which have seen increased interest in testing debt issuance solutions based on DLT, and in some instances, in conjunction with digital assets. In the medium to long term, the impact will be determined by the

¹⁰ FCA, Global Financial Innovation Network, 9 August 2018 (<https://www.fca.org.uk/publications/consultation-papers/global-financial-innovation-network>)

firms' ability to transition from the confined regulatory sandbox environment and comply fully with relevant regulations once the testing phase has been completed.

- (ii) **Canada:** The CSA/ACVM Regulatory Sandbox was officially launched on 23 February 2017. A list of firms that have been admitted to the regulatory sandbox, including detailed information on the regulator's decision and specific conditions are available on the CSA's [website](#). Accordingly, 8 firms were admitted to date and have tested innovative technology solutions related to:
- **Cryptocurrency investment funds:** [Majestic Asset Management LLC](#), [Rivemont Investments Inc.](#), [3iQ Corp.](#), [Ross Smith Asset Management ULC](#) [Fund closed], [First Block Capital Inc.](#);
 - **Initial coin offerings:** [Token Funder Inc.](#), [Impak finance Inc.](#)
 - **Online venture capital raising and angel investing in startups:** [Angel List](#), LLC and AngelList Advisors LLC
- (iii) **Australia:** The ASIC regulatory sandbox was introduced in December 2016. Information is available on four firms currently admitted to the sandbox regime, while two others have completed trials. Overall, most tested solutions appear to focus on **retail applications**:
- Retail banking: [Circle Software Services Pty Ltd](#); [Wildcard Money](#); [First Rung](#) [Sandbox trial completed].
 - Retail/online peer-to-peer lending platform: [Compeer Finance Pty Ltd](#)
 - Retail/investment app: [Goodments](#)
 - Investment advice: [Destinationsecret.com Pty Ltd](#) (DSI Capital)
- (iv) **Singapore:** The MAS FinTech Regulatory Sandbox was [set up](#) on 6 June 2016. Four firms are currently listed on the MAS' website in the following areas:
- **Robo-advice / wealth management:** [Kristal Advisors \(SG\) Pte Ltd](#)
 - **Forex/ Money transfers/remittances:** [Thin Margin Pte Ltd](#); [TransferFriend Pte Ltd](#) ("no longer licensed to advertise or carry on a remittance business in Singapore from 22 July 2018" according to the MAS).
 - **Insurtech:** [MetLife Innovation Centre Pte Ltd \(« MICPL »\)](#)
- (v) **Hong Kong:** The Fintech Supervisory Sandbox (FSS) was initially [launched](#) by the HKMA in September 2016. As of June 2018, 33 "new technology products" have been tested, out of which 25 have been completed and rolled out. However, the names of the participating firms have not been published, and further information on specific use cases does not appear to be publicly available. Technology trials cover the following areas:
- **Biometric authentication (7 trials)**
 - **DLT (5)**
 - **"Soft" token (4)**
 - **Chatbots (2)**
 - **Others (15)**

The SFC has also established a regulatory sandbox in September 2017. Further details on participating firms and use cases do not appear to be publicly available.

FinTech Accelerators: Sectors and use cases

Again, the degree of publicly available sources on the technologies trialled and specific uses cases varies. Below is a brief summary of selected use cases published by the Bank of England and Monetary Authority of Singapore.

(i) **UK:** The Bank of England (BoE) launched a FinTech Accelerator in June 2016, and as part of this initiative, a proofs-of-concept (PoC) programme to explore use cases for central banking. Over a dozen PoCs have been carried out to date. A detailed description of each PoC, and assessment of its potential benefits and disadvantages is publicly available. The technology focus has been on DLT, data storage and analysis, machine learning and cyber security. Use cases include:

- **Transfer of asset ownership in a DLT environment – [PwC](#):**
This PoC “proved it was possible to build a multi-node scalable DLT environment enabling the transfer of ownership of a fictitious asset. But it also demonstrated that the technology was some way from being sufficiently robust or scaleable to form the core of live central bank infrastructure such as the Bank’s Real-Time Gross Settlement (RTGS) service.”¹¹
- **Synchronised settlement of two different currencies based on DLT – [Ripple](#):**
The BoE “successfully integrated the Ripple solution with two simulated Real Time Gross Settlement (RTGS) systems, hosted in the cloud, and demonstrated that [it] could process a successful cross-border payment across two RTGS systems simultaneously.”
- **Supporting DLT settlement models – [Baton Systems](#), [Clearmatics Technologies Ltd](#), [R3](#) and [Token](#):**
“Although the Bank has concluded that Distributed Ledger Technology (DLT) is not yet sufficiently mature to provide the core for the next generation of RTGS, it places a high priority on ensuring that the new service is capable of interfacing with DLT as and when it is developed in the wider sterling markets.” Initial testing is for UK retail payment systems. [Ongoing].
- **Machine learning API designed to recognise patterns in limit order books – [BMLL](#):**
The BoE “evaluated a platform that allows cloud-based analysis of limit order book data from a number of trading exchanges.” Overall, the test was deemed “useful”, with benefits including access to data from multiple venues through a single interface, and large cloud storage. Limitations included data availability, technical issues related to the API, and user friendliness.
- **Machine learning for checks of transaction data for calculating the Bank’s reformed SONIA benchmark – [MindBridge Analytics Inc](#):**
“In this second phase, the Bank will build on those learnings to look at the versatility of the MindBridge Ai Auditor™ tool to provide data visualisation and data preparation techniques for larger numeric and transaction-level datasets. We are interested in the potential of machine learning to assist the way the Bank conducts plausibility and validation checks on different types of datasets.” [Ongoing].

¹¹ The Bank of England’s FinTech Accelerator: what have we done and what have we learned?, Remarks given by Andrew Hauser, Executive Director, Banking, Payments and Financial Resilience, 6 October 2017 (<https://www.bankofengland.co.uk/-/media/boe/files/speech/2017/the-boes-fintech-accelerator-what-have-we-done-and-what-have-we-learned.pdf?la=en&hash=F4068A80F87E00D783B96C0157D4B4FE10A9AA52>)

(ii) **Singapore:** The MAS launched a FinTech initiative dubbed “Project Ubin” in 2016. The aim is to test the application of distributed ledger technology for central bank digital money. Background information on the different phases of the project is available on the MAS’ website.

- **Project Ubin: Central Bank Digital Money using Distributed Ledger Technology – [R3](#) and [other financial institutions and technology providers](#).**

The aim of this project was to explore the concept of Central Bank Digital Money using Distributed Ledger Technology (DLT). The first phase focused on domestic inter-bank payments using a central bank issued Singapore Dollar equivalent on the basis of a private Ethereum network. A detailed report on the first phase can be found [here](#). In the [second](#) phase of this project, software prototypes for decentralised inter-bank payment and settlements with liquidity savings mechanisms were developed. Importantly, it is [planned](#) in a future spin-off project to apply DLT to “fixed income securities trading and settlement cycle” with a view to increasing efficiencies led by Singapore Exchange (SGX).¹²

Conclusion

In response to the increasing importance of FinTech, financial regulators have put in place different schemes to address innovation. These can be broadly split into three different categories according to a recent publication by the BCBS: (i) innovation hubs, (ii) accelerators, and (iii) regulatory sandboxes. While a shared objective is to provide regulatory guidance, the precise level of guidance and support is dependent on the individual supervisory or regulatory authority, its mandate and the regulatory framework.

Out of 26 selected jurisdictions across Europe, Asia and North America, it can be observed that a majority have set up dedicated FinTech units or “innovation hubs”, while “accelerators” have been put in place in a few selected jurisdictions only. However, the concept of a regulatory sandbox, coined and introduced by the UK FCA in 2016, has gained wider traction globally. From the 26 jurisdictions, at least 7 jurisdictions have set up an operational regulatory sandbox framework, while others have announced plans to create such a framework. Most initiatives have been put in place within the last two to three years.

The level of publicly available information on technology tested and use cases in FinTech accelerators or regulatory sandboxes varies. Based on a review of use cases published notably by the UK FCA, Canada’s CSA, Australia’s ASIC, Hong Kong’s HKMA, and Singapore’s MAS, it appears that a majority of innovative solutions target the retail segment. That said, the number of Fintech applications for capital markets has increased markedly in the UK FCA’s sandbox since its launch in 2016, the focus being on distributed ledger technology (DLT), and more recently, digital assets. A key theme is the tokenisation of debt instruments in a DLT environment, targeting at least initially small or medium-sized issuers, and private placements. In Canada’s CSA regulatory sandbox, testing involved cryptocurrency investment funds and initial coin offerings. It is worth noting that DLT has also been a focus in FinTech accelerators for central banking use cases, explored in particular by the Bank of England and the Monetary Authority of Singapore.

¹² Further details can be found here: http://www.aseanbankers.org/ABAWeb/files/Resources/Andrew_Koay_-_ABA_COFITT_FinTech_Workshop_Apr2018.pdf

ICMA will continue to monitor developments in the regulatory FinTech landscape and its potential impact on international debt capital markets. It will be interesting to see to what extent innovative technology solutions tested in a confined regulatory sandbox framework will succeed in a fully regulated environment.

Prepared by:
Gabriel Callsen,
ICMA, September 2018

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