FOREWORD

As ever, technologies around the financial services industry are continuing to evolve at an increasingly rapid pace. Whilst continuing threats around cybersecurity still prevail, the industry is keeping a close eye on the development of new technologies to combat this. The hype around blockchain has carried over from previous years, however, we are now detecting more a sense of realism in terms of practical applications. Technologies such as Artificial Intelligence (AI) and Quantum Computing are also receiving more attention. These are interesting times for the industry and the SWIFT Institute intends to be on hand to help provide the financial community with guidance on these important topics.

The SWIFT Institute has been busy on the research front, and has either published or issued grants for work in areas including instant payments, a comparison of the fintech revolution in China and the West, as well as ground-breaking regulatory developments, such as the transformation of the competitive landscape in European banking by the Revised Payment Services Directive (PSD2).

In October this year we wrapped up another successful programme at Sibos. Highlights include Ruth Wandhöfer and Barbara Casu from Cass Business School presenting their recently published work The Future of Correspondent Banking Cross-border Payments, which looks at seven design scenarios (including SWIFT’s gpi and technologies such as DLT), and identifies their preferred option for addressing today’s main pain points. A presentation and panel discussion took place based on our ongoing research on the “Future Generation of Payment Market Infrastructures”, which considers a variety of financial innovations in driving disintermediation. The Lunch & Learn sessions continued to be popular with topics such as the benefits of AI in terms of cost reduction and resource optimisation, as well as an examination of different applications for financial services.

Looking to the future, we are planning an AI conference to take place in New York in the second quarter of 2019. We are excited to be conducting new research on the long tail of cybersecurity and how the interconnectedness of today’s banking system means that all members of the financial community need to remain on the same level of alert. Furthermore, the SWIFT Institute recently announced a new grant at Sibos during the WOW - Women of the World - event regarding gender diversity. This research will look at how banks with a more diverse outlook will be better placed to handle future changes. The research findings will be presented at Sibos 2019 in London.

There are many questions for the industry, both in terms of how to best deal with the fast-moving pace of technological change and how to manage the changing face of human resources. The SWIFT Institute will continue to identify, examine and explore how the financial industry can remain relevant in the future for their customers, as well as how it can best manage new technologies and opportunities.

Peter Ware,
Director
The SWIFT Institute
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1) RESEARCH

The SWIFT Institute is continuing its role as an originator of topical studies, and a repository for research that engages the global financial industry with relevant, constructive debate. The broad scope includes pressing contemporary concerns as well as predictive future examinations. The SWIFT Institute makes incisive research possible and ensures that the findings are freely available to download and share at www.swiftinstitute.org.

42 research grants have been issued to date, with 33 completed papers published and nine underway. For details of all research grants issued, refer to Appendix A.

a) PUBLISHED PAPERS

i) The Future of Correspondent Banking Cross-border Payments

In recent years, new technologies and infrastructures have been developing, presenting both opportunities and challenges. Against this background, the research aimed to develop building blocks for a future blueprint for cross-border payments. A particular focus was placed on the wholesale aspects of these flows, as they constitute a systemically important area of business. A first step in the research was the identification of current challenges of the existing correspondent banking model. The researchers asked financial institutions what the major pain points were with the way the market currently operates. The results indicated the following key challenges:

- A lack of visibility of transaction-related costs;
- A lack of information throughout the lifecycle of a payment; and
- A lack of data to reconcile transactions.

The researchers took a pragmatic approach to address the challenges through the development of seven design scenarios – some live and some planned or theoretical (the scenarios include SWIFT’s gpi, and technologies such as DLT). They evaluated the potential benefits and drawbacks of each. The research concluded that technology alone is not a solution to all problems of cross-border payments. Aside from adoption, network governance is a key requirement, as well as a need to deliver more agreement and transparency between financial institutions.

- Ruth Wandhöfer, Cass Business School at City, University of London
- Barbara Casu, Cass Business School at City, University of London

ii) Quo Vadis? A Comparison of the Fintech Revolution in China and the West

China and the West are at different stages of fintech maturity. China has moved well beyond the tipping point and now represents the largest single fintech market in the world. China is a market that has historically been underserved by the traditional banking sector and this is reflected in quite different fintech models. China’s fintech success derives not just from a technological advantage and unprecedented innovation, but also from integrating finance and real-life needs. Since most Chinese consumers have access to financial services through mobile phones and there are no legacy systems, fintech has a huge advantage over bricks and mortar locations. Fintech has also grown faster in China relative to the West in three particular areas: P2P lending; mobile payments; and artificial intelligence. This paper compares the evolution of fintech in China with three Western markets (US, UK and Sweden) and links differences in the Chinese and Western fintech sectors to variations in legal, political and cultural regimes.
iii) Transatlantic Extraterritoriality and the Regulation of Derivatives

Full title: Transatlantic Extraterritoriality and the Regulation of Derivatives: The Need for an Integrated Approach Between Washington and Brussels and the Uncertainties of Brexit and New Directions in the US

This paper examines the common approach reached between the Commodities Future Trading Commission (CFTC) and the European Commission (EC) on derivatives regulation, and reviews issues leading to fragmentation of the $553tn global derivatives market. While many differences have been resolved, it would have been better for the markets had both the European Union (EU) and United States (US) adopted a collaborative approach when reforming derivatives after the 2008 Financial Crisis. The question now is whether co-operation between US and EU regulators can survive the disruption posed by Brexit and the Trump Administration and the new directions the UK and US might take in terms of derivatives regulation.

The long-term effect that Brexit may have on the regulation of derivatives will depend on the new post-Brexit relationship that the UK and the EU agree upon. It is essential that the smooth functioning of the international derivatives trading market and the critical role that London plays as the global centre for Euro-denominated clearing must continue without regard to whether a political agreement can be reached on the withdrawal of the UK from the EU.

In the US, if the Trump Administration can reform current CFTC regulation to reduce the extraterritorial impact that current US swaps trading rules have on non-US market participants, this could be beneficial to reduce the fragmentation that is occurring in the global swaps trading pool. It is encouraging to see Chairman Giancarlo propose implementing a two-tier system that would separate foreign jurisdictions into those that are “comparable” and those that are “non-comparable” in order to afford comparable jurisdictions greater control over their own regulatory matters. However, such a reform will require Congress to act and they will look to what the EU is doing in respect of its European Market Infrastructure Regulation on derivatives, central counterparties and trade repositories (EMIR 2.2) reforms before committing the CFTC to reducing the control it asserts on non-US market participants.

b) Research Underway

i) Public-Private Partnerships to Disrupt Financial Crime: Australia’s Fintel Alliance

Criminals regularly target the private sector, and the services it provides, to facilitate crime, launder money and move illicit funds through the economy. Criminals take advantage of the disparate information holdings of law enforcement agencies and the private sector. To prevent this situation enduring, arrangements are needed that harness these disparate information holdings to secure a common objective: fighting financial crime. While law enforcement needs the private sector’s information to identify, arrest and prosecute perpetrators; law enforcement’s information can assist the private sector to detect and report potential criminal activities as well as protect their business
and customers. With this in mind, public-private partnerships are a way of conflating the information holdings of law enforcement and the private sector. While such partnerships often focus on specific projects, their benefits can be broader: building trust between participants, providing insights into emerging threats and risks, and highlighting the challenges participants face.

This research investigates whether information sharing using public-private partnerships (PPPs) could improve the sharing of information about financial crimes between these sectors, and potentially reduce the incidence and threat of them. The research showcases the work of Australia’s Fintel Alliance. Launched in 2016, the AUSTRAC-hosted Fintel Alliance has raised interest internationally and is considered to be one of the world’s most ambitious public-private partnerships.

- Paula Chadderton, Centre for Counter-Terrorism Coordination, Department of Home Affairs
- Simon Norton, Australian Strategic Policy Institute (ASPI)

### ii) Future Generation of Payment Market Infrastructures

Payment system infrastructures are facing considerable turmoil because of the confluence of new attitudes of regulatory scrutiny from central banks and financial conduct authorities, new business models associated with fintechs and challengers, and from technologies that offer new control mechanisms and promises of cheaper, faster, safer and more transparent methods. This research analyses existing patterns of payments to assess the likely areas where challengers might emerge, and incorporates systematic interviews with banks and challengers about their attitudes, expectations and preferences.

Three potential scenarios for future payment systems markets are examined:

- **Status quo**: A continuation of existing practices and processes. Participants will gradually migrate to accommodate the technical facilities afforded by greater speed, transparency and monitoring within existing bank and customer-based structures and procedures.
- **Consolidation**: A condition of almost ‘ideal unification’ of infrastructure. Alternative closed systems will continue to exist, but major routine practices are conducted over the consolidated infrastructure. Alternative infrastructures fail to create necessary levels of liquidity and are abandoned.
- **Interoperable fragmentation**: The industry seizes upon the opportunities fintech challengers offer to create a diverse set of interconnections facilitated by new technologies. Unity is replaced by a system of managed alternatives that allow customers as well as banks to choose among specialised services for different kinds of payments based on individual requirements and special circumstances.

- Jonathan Liebenau, London School of Economics
- Dana Lunberry, London School of Economics
- Daniel Gozman, University of Sydney Business School

### iii) Sharing Cyber Threat Indicators

In August 2017, the SWIFT Institute published research titled *Sharing Insider Threat Indicators: Examining the Potential Use of SWIFT’s Messaging Platform to Combat Cyber Fraud* which proposed a protocol for sharing insider threat activities between financial institutions. Building from the
assumption that cyber criminals work off a shared services model to give them access to infrastructure, tools, targets and options for monetising their exploits, the research asserted the strengthening of communication channels for defenders to share real-time threat information is essential to pre-empting cyber fraud. In late September 2017, a pilot was initiated to test this information-sharing protocol through the development of an Insider Threat Report (ITR) message type. The pilot ran for 12 months during which time participants from financial and investment services firms worked together to validate a set of insider threat indicators based on actual use cases from internal investigations and customised the ITR fields for transmitting the information over the SWIFT messaging platform. The pilot concluded with a number of findings on key challenges to this level of information sharing that, until resolved, will prevent member organisations from formalising their engagement on this effort. The authors of this research will publish these findings in Q1 2019, with a Call to Action to the industry to raise awareness and promote change for overcoming cultural resistance to information sharing.

- Elizabeth Petrie, Citigroup Inc.
- Casey Evans, Kogod School of Business, American University

iv) Transformation of the Competitive Landscape in European Banking - PSD2

This research project aims to further explore the competitive platform strategies of different key players as the European financial market transitions into the PSD2 era. Following the initial SWIFT Institute working paper on open banking and the API economy (Zachariadis and Ozcan, 2017) that was primarily focused on banks’ perspective and provided general guidelines based on extant research in other fields, this new research project will examine the platform and innovation ecosystem strategies of entrepreneurial firms (fintechs and challenger banks) as they enter this established market that is undergoing regulatory change. The strategies of the incumbents (big banks) will also be examined, who will attempt to preserve the power they currently have in this uncertain and disrupted environment. An analysis will be done of both banks and fintechs in real time as the critical parts of a newly forming ecosystem in this setting, examining how they interact with each other as well as with regulators in order to become or remain powerful in the new environment. The findings will be compared with other industries, such as the telecommunications industry, in order to produce a set of general guidelines for firms to follow in similar environments by practically tracing the evolution of platform markets and the strategic decisions therein. In summary, this research will seek to answer:

- What are the competitive platform strategies of entrepreneurial firms entering into the European banking industry while its institutions are transitioning with the introduction of PSD2?
- What are the competitive platform strategies that the incumbents adopt in order to remain powerful in this changing environment?
- How do the structure of the market and the nature of inter-firm relationships change following the enforcement of PSD2 that is aimed at letting innovative small firms into the market to level the competitive playing field?

- Markos Zachariadis, Warwick Business School, University of Warwick
- Pinar Ozcan, Warwick Business School, University of Warwick
v) The Potential of Instant Payments
Recent developments in the payment ecosystem draw attention to the adoption of instant payments as well as to the rise of decentralised digital currencies. However, the value propositions and unintended consequences of these emergent infrastructures are still not clearly understood. Accordingly, this research studies how different payment infrastructures facilitate the creation of value and how the adoption of instant payments can bolster the integration of products and services at lower layers of the payment ecosystem. Building on transaction cost economics as a guiding framework, a comparative case study of low-value payments is being conducted, moving through the current ecosystem vis-à-vis a new ecosystem with instant payments support, and an ecosystem that relies on decentralised digital currencies.

The main objective is to develop an understanding of the implications of an instant payment infrastructure in terms of how it can allow for new forms of organising and the integration of new services sitting at lower layers of the financial ecosystem. Moreover, this research aims to compare three different payment infrastructures, their governing structures and technologies to draw an understanding of how value is created among them and how some infrastructures encourage better ways of organising (e.g. through more efficient processing of payments or higher accessibility). In doing so, this study aims to unbundle the different opportunities for the use of an instant payment infrastructure.

- Jonas Hedman, Copenhagen Business School
- Juan Giraldo, Copenhagen Business School
- Michel Avital, Copenhagen Business School

vi) Assessment of Cryptocurrencies and DLT in the Banking Sector
This research assesses the extent to which distributed ledger technology and associated crypto-assets can be the foundation for a major technology-based change in the value chains in banking. A range of applications, both current and potential, across the full range of banking services will be examined, including domestic and international payments, securities and derivatives trading, loan intermediation, supply chain finance, and asset management and servicing. The argument currently expected to be made is that DLT and its associated virtual assets are typically only one element required for solving a business problem or for technology-based delivery of a customer service. Moreover DLT, and the associated possibilities it supports for sharing of data, is just one part of the much wider range of disruptive technological innovations affecting value chains in financial services, including for example, AI and online platform-based competition and delivery.

Furthermore, the research will assess the relationship between the new technologies and financial regulation, both in terms of the possibilities of employing DLT as a regulatory technology and the challenge of regulating ‘crypto assets’. In addition, the implications of DLT for central banks, for the economics of payments, and for macroeconomic and financial stability will be examined. The employment of DLT for payments instruments and payment execution, analysing the possibilities of decentralised arrangements without a central bank, or alternatively as a central bank support, are also assessed.

- Alistair Milne, School of Business and Economics, Loughborough University
- Anil Kavuri, Australian National University and Loughborough University
vii) Measures to Improve the Cybersecurity of Smaller Financial Organisations

A system’s cybersecurity is only as strong as its most vulnerable components. Minimising risk to the integrity, availability and confidentiality of financial data cannot be achieved without the protection and participation of the “long-tail” of small organisations. This research aims to enhance the knowledge, preparedness, and resilience of smaller financial organisations by:

- Characterising the particular cybersecurity risk landscape faced by small financial organisations. The project will seek to understand small organisations’ specific challenges, needs, perceptions, and misconceptions about cybersecurity, while also depicting how they fit into the broader picture of the security of the global financial ecosystem.

- Producing an actionable package of achievable cyber hygiene security measures. Combining regional and sectoral research with insights from a range of expert interviews, this research will centralise information about resources and gather and rank applicable best practices. Many of the most common types of cyber incidents and the basic cyber hygiene measures that could prevent them have already been identified by larger institutions. This project will mine this information to present solutions that are clear, accessible, and achievable for small financial organisations.

- Inspiring more holistic conceptions of and approaches to cybersecurity. Equally as important as the immediate, tangible steps taken as a result of the findings is that small organisations move forward with a more rounded, continuous understanding of cyber risk and cyber hygiene. Cybersecurity cannot be solved with one round of fixes, nor can it successfully be handled as an entity separate from the rest of an organisation’s operations. This research will include recommendations on how to more effectively integrate cybersecurity considerations into organisations’ overall missions and functions.

- Tim Maurer, Cyber Policy Initiative, Carnegie Endowment for International Peace
- Kathryn Taylor, Cyber Policy Initiative, Carnegie Endowment for International Peace
2) EVENTS

Over the past year, the SWIFT Institute provided thought leadership content to Sibos and SWIFT Forums from the academic world, as well as from leading experts in industry.

a) Sibos 2018

Every day is a school day, and that was never more true than at Sibos Sydney where the SWIFT Institute hosted a dedicated programme focused on educational insights on a wide range of topics including AI, quantum computing, open banking, cyber and diversity. 17 sessions were held, giving delegates the opportunity to hear experts discuss topics relevant today, as well as tomorrow.

The ever-popular SWIFT Institute “A Question of Finance” Quiz returned for the fourth year in a row. Two teams, each with contestants from academia and the financial community, engaged in a battle of wits in a fun and fast paced quiz show on the financial industry.

For some sessions, scribes and video recordings are available; you can find these [here](#).

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Example of a scribe, this one for the Future of Correspondent Banking session.

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i) The Future of Correspondent Banking

This session is related to the recently published research paper, [The Future of Correspondent Banking Cross-border Payments](#) by Ruth Wandhöfer and Barbara Casu from Cass Business School. The research addresses the current challenges of the existing correspondent banking model through the development of seven design scenarios.

Key takeaways from the session included:

- SWIFT gpi implementation by financial institutions has the potential to deliver greater transparency to cross-border payments. This enhanced transparency, complemented by
increasing predictability and discipline over time as additional rulebooks and SLAs are put in place, will help institutions to better manage counterparty and financial stability related risks in the interbank space;

- Regulators will play a key role in further promoting the adoption of ISO 20022 and the LEI as well as taking measures in support of the industry’s ability to comply with AML/KYC/CTF (e.g. KYC registries), harmonisation of rules and provision of more clarity and encouragement for inter-financial institution information sharing;
- The deployment of new technologies, such as DLT, is no panacea. Apart from the lack of maturity of this technology, there are only a few international bodies that have thus been successful in delivering distributed network management across a range of diverse stakeholders. Network governance is a key requirement that cannot be delivered by technology alone and there is a need to deliver more SLAs and transparency between financial institutions;
- Before considering a move onto a new technology stack based on DLT, it needs to be proven that the technology can work in the intended way at a scale, and that the technical migration challenge is feasible for the size of the network to be covered.

ii) The Future of Instant Payments
Juan Giraldo of the Department of Digitalisation Copenhagen Business School provided an interim update on current research examining the organisation of specific case studies regarding the use of Blockchain (DLT) across real-time payment platforms and infrastructures. Currently, there are three approaches for DLT in real-time payment systems covering:

- Incremental: building upon existing knowledge, processes and concepts without radically changing them;
- Modular: extending the current product concepts without changing its fundamental principles/processes;
- Architectural: shifting the fundamental business processes while keeping the same general concepts of payment instruments.

iii) The Future of Payment Market Infrastructures
A presentation and panel discussion showcased new research currently underway by Danny Gozman from University of Sydney Business School and Jonathan Liebenau from the London School of Economics. The scope of the research is to assess new trends in payment market infrastructures (PMIs) and consider the effects of recent innovations, as well as the incentives and potential for continuing innovation.
The session covered the “change drivers” including:

- Shortcomings of legacy PMI interoperability;
- New applications of financial innovations creating disintermediation;
- Global focus on customer experience and strengthening competition;
- Concern from banks regarding shifting control of payments traffic and liquidity;
- The pressure of regulatory outcomes and greater transparency; and
- Cybersecurity and emergent technologies.

The research explores three potential scenarios for the future including the status quo, potential consolidation and interoperable fragmentation.

iv) Open Banking

A presentation and panel discussion showcased new research currently underway by Markos Zachariadis and Pinar Ozcan of Warwick Business School. Following the initial SWIFT Institute working paper on open banking and the API economy, this new research explores the platform and innovation ecosystem strategies of entrepreneurial firms (fintechs and challenger banks) as they enter this established market under PSD2. The strategies of the incumbents (big banks) will also be examined, who will attempt to preserve the power they currently have in this uncertain and disrupted environment. The researchers and panel discussed the paradigm shift that is underway toward platform models led by regulatory pressure and enhanced competition, technological developments, and market conditions.

v) A Comparison of Fintech in China versus the West

This presentation focussed on new research comparing the evolution of fintech in China with the US, UK and Sweden in the paper Quo Vadis: A Comparison of the FinTech Revolution in China and the West Revolution in China and the West by Bonnie Buchanan (and Cathy Xuying Cao) of Hanken
School of Economics and Albers School of Business & Economics Seattle University. Conclusions of the session were as follows:

- In China, the P2P lending industry has experienced phenomenal growth with platforms focusing on four industry segments: lending for consumers; small businesses; auto; and real estate;
- The Chinese P2P lending market has faced multiple challenges due to its meteoric growth, the lack of regulations and risk management, as well as severe information asymmetry problems. P2P lending across the US, UK and Sweden have also faced various challenges, including some very public cases;
- Many Chinese cities have become cardless and cashless due to the ubiquity of mobile payment facilities. The rapid growth of China’s third-party mobile payment system is attributable to a number of factors including mobile cellular phone subscriptions;
- A number of factors explain the increasing dominance of China in the AI area, including scale and vast amounts of data, as well as facial recognition and AI chip technologies.

vi) Securing the Future of Financial Services through Improved Diversity
An enlightened panel discussion took place regarding the commercial benefits of diversity including Rachel Cooper, Professor Gender, Work and Employment Relations of The University of Sydney Business School, Rosemary Stone, Global Head Of Human Resources at SWIFT, and Samantha Turner, Group Head Of Inclusion & Diversity at Westpac. The panel was moderated by Julia Streets, Founder & CEO of Streets Consulting Ltd.

The panel spoke about major barriers to change and the long-term journey in addressing inclusion and inclusive leadership focus. In terms of accelerating dynamics, suggested areas to be examined included succession planning, reward systems and flexible working. Inclusive leadership training should also be extended to the middle management layer.

Diversity was applauded for its commercial benefits. For example, it was recognised that diversity and people thinking differently will be vital in the battle against cybersecurity. The panel concluded that the industry is going through a period of transformation and now is the time to take the opportunity to make diversity part of that transformation and shake off old stereotypes.

Listen to the Diversity Podcast here.

vii) Quantum Computing
Andrea Morello, University of New South Wales, gave a dynamic presentation with a down-to-earth explanation of quantum computing and its benefits, including the calculation of computationally heavy problems such as pharmaceutical and chemical compound design, improved searches of unsorted databases, and better data encryption. Morello explained that quantum information is exponentially denser than classical information, and therefore actually using this information is a non-trivial exercise. It was noted that quantum computers can be built using the same manufacturing technology as traditional silicon chips.
John Trundle, CEO of Euroclear UK & Ireland, provided an overview of the reasons behind why we have regulation, as well as its different forms and trends. He stressed that financial regulation is necessary for consumer protection and to make markets work. However, this has become more imperfect and increasingly costly and complex over time. Whilst regulation has an impact on market structure, innovation and growth, regulatory challenges do exist. These challenges are exacerbated when working across different jurisdictions, yet there is currently no sensible alternative to seeking cooperation amongst regulators.

ix)  AI and Machine Learning
Uwe Aickelin, University of Melbourne, gave a practical overview of AI, explaining that it was not simply about robots, but rather about reducing costs, increasing benefits and optimising resource. Accuracy of decisions can be improved, for example: either predictive analytics to find out what changes will happen, or prescriptive analytics to advise what action should be taken. Examples of this in the financial industry include dynamic pricing, customer churn, demand forecasting, credit risk and fraud detection. Aickelin explored the differences between automation, which is software or hardware that follows pre-programmed rules, and AI, which is software designed to simulate human thinking.
b) SWIFT BUSINESS FORUMS
The SWIFT Institute provided thought leadership from academia for several SWIFT events throughout the year, focusing on research in progress (future of payment market infrastructures and open banking), as well as providing insights into the possible future of the banking industry.

i) SWIFT Business Forum Nordics, March 2018
Dana Lunberry, London School of Economics, participated in a panel discussion on “Future-proofing Market Infrastructures in the Nordics”.

ii) SWIFT London Business Forum, April 2018
Professors Markos Zachariadis and Pinar Ozcan, Warwick Business School, discussed “From Banks to Platforms: Strategies and Challenges for Open Banking” with Jamie Campbell, Head of Experience & Awareness at Bud Financial and Megan Caywood, Chief Platform Officer of Starling Bank.

iii) SWIFT Premium Services Forum Europe, November 2018
Professor Ron Berndsen, Tilburg University, participated in the panel discussion “Technology on Trial – Facing the Future”, a look to the future and imagining what financial services could look like in the years to come.

iv) SWIFT Operations Forum Europe, November 2018
Professor Markos Zachariadis, Warwick Business School, was part of the closing plenary with SWIFT’s Leo Punt discussing the “Future of Banking”.

c) 2019 EVENTS
The SWIFT Institute will continue to provide thought leadership to the global financial community through engagement at events where we bring academia and industry practitioners together. This will involve our participation in SWIFT forums, as well as Sibos London in September, and through a dedicated SWIFT Institute conference planned for Q2 in New York on artificial intelligence.

i) Sibos London 2019
Sibos will take place 23-26 September 2019 in London, an inaugural event for the city which is sure to be a world-class occasion. The SWIFT Institute will be on hand with a dedicated programme of lectures, Lunch & Learn sessions and panel discussions showcasing our latest research. The overarching aim is to provide educational insights and thought leadership, and to bridge the gap between industry and academia.

The SWIFT Institute is planning content to cover market infrastructures, gender diversity, artificial intelligence, open banking, instant payments, shadow banking, cryptocurrencies and blockchain. Some of these topics relate to SWIFT Institute-sponsored research that is currently underway and due for completion in 2019, meaning we will be providing Sibos delegates with the very latest research insights.
ii) AI in the Financial Industry

We will host a conference aimed at dispelling some of the myths surrounding AI. Taking place in New York in Q2 2019, the agenda will cover topics such as “Why AI is not all about robots”, and “The Difference between ‘Automation’ and ‘Intelligence’”. Sessions will examine how the use of AI can help the financial industry better prepare for (and hopefully mitigate) the next financial crisis. Amongst other topics on the agenda, we will explore:

- Business opportunities
- Implementation and operational challenges
- Security
- Limitations of AI
- Human interaction – how can AI help, rather than replace, human workers?

The conference will be hosted in partnership with a renowned university (look out for an announcement in early 2019).
3) **STUDENT CHALLENGE**

**a) 2018 STUDENT CHALLENGE**

The SWIFT Institute Student Challenge brings together the brightest minds of tomorrow to solve a banking industry issue of today. This year we focused on students in Australian universities and asked them to come up with ideas on how to protect customer data in an open banking environment. This topic was unanimously agreed upon by the Australian banking community and had the support of the Australian Payments Network.

Eight student team finalists from University of Sydney, University of Melbourne, Monash University, Carnegie Mellon University Australia, and University Technology Sydney pitched their ideas to a panel of expert judges and Sibos delegates at Sibos Sydney.

All eight finalists presented innovative ideas in an engaging manner, reflecting a solid understanding of an open banking environment. In an extremely close run competition, Team Hebe of Monash University was announced as winner of the 2018 Student Challenge during the Sibos Closing Plenary, taking home the grand prize of $30,000 AUD. Their proposal was based on a combination of behavioural economics and blockchain, in which customers decide with whom to share their data and are rewarded with economic incentives to access discounts and new products.

*Left to right: Stephan Zimmermann (Deputy Chairman of SWIFT Board); Marco Lecci and Aaron Rozario (Team Hebe, Monash University); Alain Raes (Chief Executive Asia Pacific and EMEA, SWIFT)*
b) 2019 STUDENT CHALLENGE

In 2019 we will host the fourth annual SWIFT Institute Student Challenge, which will be open to students at universities across Europe. The focus of the Challenge will be on instant payments and how the use of artificial intelligence can help mitigate fraud. Instant payments are increasingly becoming the norm around the world with consumers expecting to be able to make payments immediately in a 24/7/365 environment. This presents a challenge to the financial community. By shrinking the transaction processing window from days to seconds / minutes, the time to detect and act on fraudulent payments will be greatly diminished.

Accordingly, the Student Challenge topic chosen for 2019 is, “How can artificial intelligence improve fraud detection and prevention in instant payments?” The deadline for submissions is 30 June 2019. Shortlisted entrants will be invited to pitch their idea at Sibos London in September 2019, where the overall winner will be announced. For full details and to submit an idea, go to www.swiftinstitute.org/swift-institute-challenge/.
4) Knowledge@Wharton

The SWIFT Institute is proud to partner with Knowledge@Wharton, the online business analysis journal showcasing the intellectual capital of The Wharton School of the University of Pennsylvania.

Recognising that the greatest offering the SWIFT Institute can provide is knowledge, we wanted to have the ability to impart knowledge on a more regular basis. A partnership with Knowledge@Wharton was formed, whereby the SWIFT Institute provides the Wharton team with ideas for articles or podcasts of interest to the financial community, including research from the Institute itself. Seven articles have been published jointly by the SWIFT Institute and Knowledge@Wharton throughout 2018.

**Going Cashless: What Can We Learn from Sweden's Experience?**

Sweden is expected to become the world’s first cashless society by March 2023. This journey has been powered by various factors such as a robust card payment system, strong internet infrastructure, a popular mobile payment app, supportive legal framework and a cultural mistrust of cash.

Jonas Hedman, associate professor at the department of digitalization at the Copenhagen Business School, was interviewed about Sweden’s journey to becoming a cashless society, its implications for the rest of the world and lessons that can be learnt. Hedman argues that one strong reason Sweden is likely to become a cashless society is because of its legal framework where contract laws take a higher precedence than banking and payments laws. For example, if a store puts up a sign that it does not accept cash, then the customer has entered a contract with that store that they do not accept cash. Further, research has shown that when cash transactions fall below 7% of total payment transactions, it becomes more costly to manage cash than the marginal profit on cash sales, so retailers would likely stop accepting cash.

**How Europe’s Banking Revolution Will Boost Fintech**

Warwick Business School’s Markos Zachariadis, a professor of information systems and management, and Pinar Ozcan, a professor of strategy, spoke to on the Knowledge@Wharton podcast show on the European Revised Payment Services Directive (PSD2).

PSD2 will force banks to share customer information with third parties when customers request it, giving fintech companies more market access. This provides the possibility for entire shifts in the architecture of the industry as a whole. Instead of banks being vertically integrated, as they currently are, banks will become much more modular with a focus on collaboration. Issues remain, for example, speed versus security is a difficult issue for banks trying to collaborate with fintechs.

PSD2 may well revolutionise consumer finance in Europe and will be closely watched in the US and around the world.

**China’s New Financial Sector Reforms: Will They Go Far Enough?**

China announced that it was further opening up its financial sector by easing restrictions on foreign businesses in November 2018, with foreign firms able to own up to 51% of domestic securities, insurance and fund management firms.
Wharton management professor Minyuan Zhao commented that opportunities exist because China is still growing at a relatively fast rate. However, policy uncertainty, as well as the high leverage in the Chinese economy, will pose challenges for foreign financial institutions, as well as the slowdown of foreign direct investment into China.

Eventually, China wants to have a fully convertible currency. But it’s unclear when this will occur because the process of opening up the capital account, which goes hand in hand with renminbi convertibility, is “uncertain and slow”. China’s so-called ‘socialist market economy’ has always been driven by the goals of the state, which are economic growth in a modern economy with stability and prosperity for all.

**Banks and Fintechs: Adversaries or Partners?**
The fast-moving world of financial technology, better known as fintech, is settling into a global pattern. Disruptive fintech start-ups not long ago were thought to threaten important revenue streams of even the biggest financial institutions. But they are now pursuing business models based on collaboration with banks or even being acquired by them.

For the upstarts, tapping into the goodwill and trust that incumbents have created is a strong draw. Another huge impetus for fintech-bank collaboration is the growing threat from large technology players such as Google, Apple, Facebook, Amazon and Alibaba — popularly grouped as GAFAA. According to the World Fintech Report, the fintechs’ most preferred partnership is in white-labelling their solutions. The next preferred collaboration model is integrated in-house solutions in which products and solutions are hosted in-house (typically for larger firms), or as a software-as-a-service (for smaller firms). Over time, however, this is expected to shift to full outsourcing and fintechs leveraging APIs, among others.

In order to best deal with these developments, banks need to learn to become nimble, learn how to bridge siloes and increase their speed-to-market. Start-ups must learn to collaborate within highly bureaucratised structures and navigate complex hierarchies.

**Can Using Software to Map Financial Risks Help Predict the Next Downturn?**
This interview with Kimmo Soramäki, founder and CEO of London-based Financial Network Analytics (FNA), discusses how modelling, simulations and analytics could help make the financial system safer and more efficient. FNA designs platforms, software and algorithms that help central bankers, regulators and other institutions better visualise complex issues such as interconnectedness, systemic risks and even warning signs of financial crimes like money laundering.

During the financial crisis of 2007-2008, Soramäki advised Group of 10 (G-10) central banks in modelling interconnections and systemic risk by delving into granular payments and transaction-level data and examining interconnections. The objective was to start to make the metric visible of these exposures and thereby identify the critical nodes in that network and potential areas of collapse if certain failures occurred.

The aim of Soramäki’s software today is to automatise the creation of banking networks and to implement algorithms to identify and visualise the central spots within in that network, making it easier for any central bank, regulator or authority to start performing data analytics and simulations.
How instant payments are transforming banking and retail

Instant payment systems are transforming banking and retail, especially with the rapid rise of e-commerce amongst consumers. Juan Giraldo, PhD fellow in the department of digitalization at the Copenhagen Business School, says it is important for executives to keep pace with these new systems and the implications they hold for various sectors. Giraldo spoke to Wharton about different aspects of the payment infrastructure, the current research in this area and what more needs to be done.

“This push towards instant payments, coming from the banking and the infrastructure side, is a great opportunity for banks to maintain a competitive advantage within the payments mark,” Giraldo commented. However such a move towards an instant payment infrastructure poses mainly operational risks for banking institutions because there will be a shift from credit risk to greater liquidity risk.

How Blockchain Will Impact the Financial Sector

Cryptocurrencies and the underlying blockchain/distributed ledger technologies (DLT) are being touted as the next-big-thing after the Internet. They are expected to change industries as we know them, especially in the financial sector. So what does this mean for the various players in the sector and the end users?

Wharton spoke to Bruce Weber, dean of Lerner College and professor of business administration at the University of Delaware, Andrew Novocin, professor of electrical and computer engineer at the University of Delaware, and Angela Walch, professor of law at St. Mary’s University School of Law in San Antonio, Texas, and a research fellow at the Centre for Blockchain Technologies at University College London.

“Blockchains have the potential to displace any business activity built on transactions occurring on traditional corporate databases, which is what underlies nearly every financial service function. Any financial operation that has low transparency and limited traceability is vulnerable to disruption by blockchain applications. DLT is therefore both a great opportunity and also a disruptive threat,” said Weber and Andrew Novocin. Walch, on the other hand, worries that at present there is no clarity on how power and accountability work in these systems. Weber and Novocin are of the opinion, however, that clearer standards will be adopted with a few high profile projects emerging. Additionally, R&D will continue among the many decentralized blockchain projects to invent more scalable public ledgers.
5) OTHER ACTIVITIES

We are continually searching for new ways in which we can increase knowledge amongst the financial community and also seek out new thought leaders within the industry. As such, in 2018 we have continued to endorse third-party educational courses, and are pleased to partner with the 7th edition of the Ethics & Trust in Finance Prize.

a) THIRD-PARTY EDUCATIONAL COURSES

Introduced last year was the SWIFT Institute’s endorsement of third-party executive education courses. These courses, covering both in-house and online training, are delivered directly by the institutions that created them and are aimed at industry practitioners. We continue to endorse these courses, and are pleased to see that they are proving beneficial to practitioners.

i) Certificate in Principles of Payments by The London Institute of Banking & Finance

The Certificate in Principles of Payments (CertPAY) is a specialist qualification for anyone working in the finance industry such as payments professionals, managers, and operational, compliance & risk teams. Since launching this online payment certification course, there have been 200 registrations from 23 countries, including UK, Ireland, Egypt, USA, Jordan, UAE, Indonesia, Cyprus, China, Singapore, Hong Kong, India, Australia, Holland, South Korea, Canada, Switzerland, Vietnam, New Zealand, Azerbaijan, Spain, Germany, and Nigeria. In March 2018, CertPAY was launched in China at a joint SWIFT / ICC China Banking Commission event. Plans for 2019 include an expansion of registrations and extension of reach to an even greater number of countries.

ii) Fintech - Innovative Banking by Imperial College London

The Fintech - Innovative Banking course takes place over two days and focuses on four key areas, including distributed ledger technology (blockchain), digital identity, digital money and digital payments. The course is delivered by a world-leading mix of innovative practitioners and groundbreaking academics. There have been two courses given so far, with subsequent sessions scheduled for November 2018 and May 2019. Due to the success of the course, Imperial College is considering increasing future sessions to take place over three days in order to allow for more in-depth discussions.

b) THE ETHICS & TRUST IN FINANCE PRIZE

The SWIFT Institute is proud to be a strategic partner for the 7th edition of the Ethics & Trust in Finance Prize which promotes greater awareness among young people throughout the world concerning the benefits of ethics in finance. It aims to encourage high-quality management of banking and financial services based on trust and integrity.

Every two years, the Prize invites young professionals, aged 35 years or younger, from throughout the world to participate and contribute to the reflection of the importance of the benefits of a more ethical approach to banking and finance, promoting greater awareness of the need for ethics, integrity and trust in the finance sector. Since 2006, the competition has prompted a debate about
many different aspects of Ethics in Finance, ranging from the role of compliance offices, the
challenges of managing cash ethically, the contribution of microfinance to economic development,
and the way rating systems work, to name but a few.

Candidates are invited to submit written papers that have not been previously published that
examine the role of ethics and integrity in finance. Papers can be analytical in nature or they can be
proposals for practical projects. In all cases, they should meet three criteria: intellectual rigour,
innovative ideas, and clear conclusions. The deadline for submitting papers for the 7th edition of the
Prize is 31 May 2019.
6) **LOOKING AHEAD**

The SWIFT Institute plans to continue to help bring the financial community together with academia to work collaboratively on prevailing issues affecting the financial services industry. In 2019 we plan to bring insights, through various research grants and events, on relevant topics such as AI, DLT & cryptocurrencies, and Instant Payments.

**Artificial Intelligence**

AI (and Machine Learning) has recently garnered attention within the financial world around practical applications such as compliance, fraud detection, and sanctions. Whilst AI itself is not new, what is now getting people’s attention is its applicability to the increasing amount of data surrounding us, and the value of that data. If we can better understand this data with the help of AI, we can then better understand customers, secure our customers’ transactions, automate manual processes, and help generate new product ideas. Our conference in Q2 2019 in New York will aim to improve understanding of what we can do with AI.

**DLT & Cryptocurrencies**

There has been much hype surrounding DLT, or blockchain, yet it is still early days in knowing exactly what it can and cannot do. The SWIFT Institute has research underway to assess the extent to which DLT and crypto-assets can be the foundation for a major technology-based change in banking. The argument currently expected to be made is that DLT and its associated virtual assets are typically only one element required for solving a business problem or for technology-based delivery of a customer service. Moreover DLT, and the associated possibilities it supports for sharing of data, is just one part of the much wider range of disruptive technological innovations affecting value chains in financial services, including for example, AI and online platform-based competition and delivery.

**Instant Payments**

The TARGET Instant Payment Settlement (TIPS) service aims to provide a pan-European instant payment settlement service in central bank money. Whilst a welcome development, the industry also needs to reflect on the ramifications of these fast-moving developments including the necessity of compliance checks following AML/KYC rules, and how generally the impact of a cashless society will affect large groups of people outside a jurisdiction, from homeless people to international tourists.

However, the value propositions and unintended consequences of these emergent infrastructures are still not clearly understood. Accordingly, this research studies how different payment infrastructures facilitate the creation of value and how the adoption of instant payments can bolster the integration of products and services at lower layers of the payment ecosystem. Building on transaction cost economics as a guiding framework, a comparative case study of low-value payments is being conducted, moving through the current ecosystem vis-à-vis a new ecosystem with instant payments support, and an ecosystem that relies on decentralised digital currencies.

The main objective is to develop an understanding of the implications of an instant payment infrastructure in terms of how it can allow for new forms of organising and the integration of new services sitting at lower layers of the financial ecosystem. Moreover, this research aims to compare three different payment infrastructures, their governing structures and technologies to draw an understanding of how value is created among them and how some infrastructures encourage better ways of organising (e.g. through more efficient processing of payments or higher accessibility). In doing so, this study aims to unbundle the different opportunities for the use of an instant payment infrastructure.
# APPENDIX A – PUBLISHED & ONGOING RESEARCH

All published research papers are freely available on [www.swiftinstitute.org](http://www.swiftinstitute.org).

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<td>Asad Ata, Mahender Singh</td>
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<td>Can Mobile Money be Used to Promote Savings? Evidence from Preliminary Evidence in Northern Ghana</td>
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<td>The Global Network of Payment Flows</td>
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<td>A Dynamic Stochastic Network Model of the Unsecured Interbank Lending Market</td>
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<td>Modelling the Cost of Financial Services</td>
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<td>Theory of Optimum Financial Areas: Retooling the Debate on the Governance of Global Finance</td>
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APPENDIX B – BACKGROUND INFORMATION

The SWIFT Institute is the research arm of SWIFT. It aims to provide knowledge through sponsored research projects. The SWIFT Institute unites academic study with the practice of global finance to bolster the spread of big new ideas. Through the funding and publishing of a broad range of cutting-edge research, we encourage collaboration between thought leaders in finance and academia. The more than 40-and counting grants awarded for independent research demonstrate the Institute’s commitment to engaging the industry with relevant, constructive debate. The SWIFT Institute makes incisive research possible and ensures that the findings are disseminated across the globe.

For more details please visit www.swiftinstitute.org

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Sibos is the annual conference, exhibition and networking event organised by SWIFT for the financial industry. It is the premier business forum for the global financial community to debate and collaborate in the areas of payments, securities, cash management and trade. For one week every year, Sibos brings together some 8,000 business leaders, decision makers and topic experts from a range of financial institutions, market infrastructures, multinational corporations and technology partners.

For more details please visit www.sibos.com

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