CHAPTER 19

SWIFT

Trusted Infrastructure for Infrastructures

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1 Introduction

Money and finance have been conceptualised as an infrastructure for the economy and for society (Muellerleile, 2018; Ricks, 2018). Finance has developed its own infrastructures, defined as 'the socio-technical systems enabling basic yet crucial financial functions to be carried out, but that tend to be taken for granted and assumed' (Campbell-Verduyn, Goguen, and Porter, 2019, p. 911). As financial activities have become more complex and speculative, centralised ordering institutions such as central banks and financial infrastructures have evolved (Norman, Shaw, and Speight, 2011) to smooth the conduct of finance and commerce across space and time. This chapter engages with SWIFT (Society for Worldwide Interbank Financial Telecommunication) as a long-standing, monopoly-like infrastructure and employs a meso-level infrastructural gaze, showing interdependencies between micro-level, often backgrounded, socio-technical systems and processes, and macro-level concerns of legitimacy and power (see Chapter 1 of this volume).

What constitutes financial infrastructure is not exactly defined. It broadly includes organisations that conduct the core financial markets' processes and functions of risk mitigation, trading, clearing, and settlement (see Handel, this volume; Genito and Lagna, this volume). Exchanges take care of securities trading activities and have evolved into large groups, whose activities and market data shape financial markets (see Petry, this volume), while post-trade activities, like clearing and settlement,[1] are performed across a variety of actors. Every economic and financial transaction necessitates payment, with clearing and settlement of payments performed by various payment systems for different kinds of payments.

SWIFT, however, does not fit into these categories of financial infrastructure. While many infrastructures store and transfer value, whether as money or as securities, SWIFT, and this is a key distinction, *transfers data/information about value between banks and financial infrastructures internationally*. SWIFT's original role and raison d'être was in providing a secure, digital, international financial messaging system for international

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payments for a small group of Western banks in the 1970s. Since then, it has expanded into messaging for post-trade securities transactions, which now accounts for more of its messages than payments (SWIFT, 2021a). It has also expanded its membership globally to other financial actors beyond banks. It further offers more shared services to its member financial institutions, such as payments reference data to ensure proper routing of transactions, and for financial crime compliance, which all banks must do. SWIFT's quasi-monopoly position began with the adoption of a cooperative solution among rival banks due to distrust in a service provided by one leading bank (Citi). It then grew via network effects and standards, adding increased benefits for members. In so doing, it has become a critical 'infrastructure for infrastructures' (Robinson, Dörry, and Derudder, 2023, p. 485).

This chapter unravels SWIFT's role as trust provider by examining its workings, technologically and organisationally. Trust is integral to money and finance. Much of the sector's growth has come from extending trust from smaller to ever larger networks (Rubinstein, 2022). Given that infrastructures are, broadly, essential supporting/enabling objects and simultaneously the relation between objects (Larkin, 2013), and featuring long-term, near-ubiquitous reliability (Plantin et al., 2018), financial infrastructures are a key method of scaling trust. Styling itself as 'the most secure trusted third party' (Scott and Zachariadis, 2014, p. 38), SWIFT refers to two dimensions:

- the financial messaging infrastructure network (SWIFTNet), and
- the organisation, a cooperative, in which SWIFTNet is embedded.

Viewing SWIFT as a 'club', its purpose is not messaging specifically but *connectivity* generally, allowing it to extend trust among its members and more broadly to financial flows. Here, we combine literature on trust and clubs to study the relationship between SWIFT's organisational design and its effectiveness in bringing about strategic change to retain its pre-eminence (Robinson, Dörry, and Derudder, 2024). Infrastructural power is usually concerned with state authority and macro-political-economic governance in national monetary networks centred around public actors, for example, central banks (see Coombs, this volume). However, SWIFT is integral to the workings of global finance, acting as a boundary object (see Pinzur, this volume) that enables cooperation and resolves tensions between local and global scales, and between public and private networks, by extending different forms of trust across space, an essential prerequisite for collaboration between financial competitors. Put differently, national networks are connected into a global network by private financial actors using SWIFT's messaging network as members of its organisation. Alongside physical networks, ideas, and standards, trust is an important component of 'the binding medium' (Easterling, 2016, p. 6) of infrastructure.

The next section explores and defines the concept of trust in finance. Sections 3 and 4 explain the architecture of global financial infrastructure as based on the account money form. Sections 5 and 6 demonstrate the significance of SWIFT's messaging network and organisational form in engendering trust among competitors and as a key relational form of agency that fosters collective action to mediate technology, geopolitical, and market challenges. The chapter closes with a critical reflection and outlook.

2 Trust in Money and Finance

Trust – or the 'social, geographical, and discursive nodal points of trust and authority' (de Goede, 2005, p. 185) – is foundational to the banking business, which is likened to 'a massive, complicated and delicate confidence trick' (Arnold, 2023, para. 1). A definition of trust, which is 'a complex and slippery notion' (Nooteboom, 2002, p. 1), encompasses several reasons and motivations for broadly having confidence or reliance that actors or things will not fail us. This can be based on control in the form

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of incentives or contracts; on self-interest or assurance, such as dependence or legal coercion; or it could be a strong sense of 'real' trust based on motives beyond self-interest. As this brief list shows, the sources of trust are distinct, lying in individuals, organisations, or a system as a clear rule provider and enforcer to (better) calculate others' behaviour and action. Central bankers, for example, consider trust to be confidence that 'authorities will act predictably in the pursuit of predefined objectives and that they will succeed in their task' (Carstens, 2023, p. 6) of maintaining trust in the monetary system as a public good and foundation of an economy. Trust, however, can take forms such as behavioural, competence, intentional, and informational in people, institutions, and organisations, but is not limitless: 'someone has trust in something, in some respect, and under some conditions' (Nooteboom, 2002, p. 8). SWIFT's technological messaging infrastructure and cooperative organisational form play a crucial role in scaling trust in money and finance globally.

Representations of trust as radiating down from central banks to lower-order financial actors as well as residing in networked groups of financial experts neglect the role of the financial 'plumbing' in providing trust (Campbell-Verduyn and Goguen, 2019). Finance is a network industry, in which competitor firms must necessarily collaborate to a certain extent. This has been evident historically in financial infrastructures, from exchanges and clearing houses up to credit card schemes, which have been mutually owned by the financial actors that use them. Trust is thus also important between organisations in *enabling* relations: it reduces relational risk, or the risk of something going wrong in a relationship; is economically relevant because it reduces uncertainty, bringing material benefits for cooperation and savings on search, contracts, and monitoring because it reduces fear of opportunism; and involves an acceptance of more influence from partners. This is the purpose of governance, which acts with other governmental instruments like contracts, incentives, reputation, and via networks (Nooteboom, 2002).

Through governance, trust is related to authority and power. The financial system comprises the combined interactions, competitive and cooperative, of its participants. Authorities and financial institutions are not the only components of the financial system. Financial infrastructures are key nodes themselves but also the socio-technical mesh (both material, like cables and network equipment, as well as immaterial, like rules and conventions for using this equipment and executing processes and functions) interlinking nodes. Trust in the reliable working of such large, impersonal social structures at societal level, or *system trust*, is a crucial phenomenon in modern times. It builds on both 'the authority attributed to formal social positions as well as on the reliability of technical systems, standards and procedures' (Bachmann, 2003, p. 64). Private actors have been granted forms of legitimate or private authority over important domains, both domestically and internationally, usually associated exclusively with the state (Hall and Biersteker, 2004). Such authority is deemed legitimate because it is ultimately delegated by interdependent public authorities (Pauly, 2004), such as those with regulatory supervisory oversight over financial institutions and infrastructures. Legitimacy implies that those governed consent to or recognise authority, which they do without coercion, but rather for reasons like persuasion or trust (Hall and Biersteker, 2004); legitimacy is invoked in the ability to mould relationships by bundling and shaping the interactions of multiple social actors in generally accepted ways (Bachmann, 2003).

Trust cannot easily be conjured from nothing and is in some ways its own prerequisite. Once established, infrastructure's stability and durability are analogous to the confidence and reliability synonymous with trust. Embedding infrastructure in a cooperative is an important way to initially engender trust among users and subsequently spread it via shared norms and practices surrounding infrastructure usage to new users and beyond. Micro-level socio-technical

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systems become thereby linked with macro-level concepts such as power.

In what follows, we show SWIFT's role in extending trust beyond national jurisdictions, within which central banks and national financial regulators/supervisors nominally only maintain trust in their own currencies. While in recent decades many financial infrastructures have been privatised, SWIFT remains a not-for-profit-maximisation cooperative, co-owned by financial institutions. We argue that the cooperative organisational form is a key enabler of trust among financial institutions and aids their collective strategic agency.

3 Money Forms and the Architecture of Financial Transactions

The architecture of financial infrastructure is contingent upon the *money form* that it supports. The two money forms for payment are physical objects/tokens, such as cash, and accounts/claims, such as commercial bank deposits. *Token money* transactions feature immediate settlement and no information exchange once the token is deemed valid (Adrian and Mancini-Griffoli, 2019). However, such transactions generally require physical proximity. *Account money* evolved from token money in medieval Europe when moneychangers transformed from custodians of physical coin to deposit banks. Instead of physically transferring coin as payment, they logged ownership of coin deposited with them in books, and then transferred ownership, thereby immobilising coin and creating account or book-entry money. This also allowed netting, or extinguishing one debt with another, leading to banks becoming *trusted* central intermediaries.

As such, banks conducted transactions for many parties across their books, with only minimal final settlement in physical money. Account money thus has two components: *value*, residing in and cleared/settled across the ledgers of financial institutions, and *data/information* about that value, requiring transmission via trusted channels (see Robinson, Dörry, and Derudder, 2023, p. 486, figure 2, for an illustration). Value, also a kind of data, can be considered money at rest and is a representation of value inherent in and created by our ecology and societies (Scott, 2022). Data is more accurately transaction information, such as payment instructions, and manifests money in motion. Account money payments do not need physical proximity or immediate settlement; rather, they require information to verify account holder identities. Account money nowadays resides in electronic accounts/ledgers of various siloed financial institutions, for example, banks. Effecting payment means changing these accounts (settlement) in response to instructions. Instructions are communicated electronically across distance in email-like messages. This secure transmission of financial information is the purview of SWIFT and of particular significance for cross-border payments, in which SWIFT's origins lie.

4 SWIFT and Financial Messaging

There are important differences between domestic and international payments. SWIFT (Euromoney, 2019, para. 11) describes global banking as 'a network of federated payment systems, where fiat currencies are settled in different jurisdictions, each with their local regulations and requirements – independent, yet interdependent on each other'; these payment systems are connected by correspondent banking 'into a meaningful value transfer system' (depicted in a stylised manner in Figure 19.1). Domestic payments (or payments in one currency) are centralised in a national payment system,[2] to which banks are directly connected as members or indirectly via a member. The payment system is generally publicly run by the central bank; it has responsibility for that currency. Interbank payments are settled in the payment system in central bank money, and payment information is communicated via the payment system's messaging system. In providing both, the central bank underwrites trust in the system. However, the

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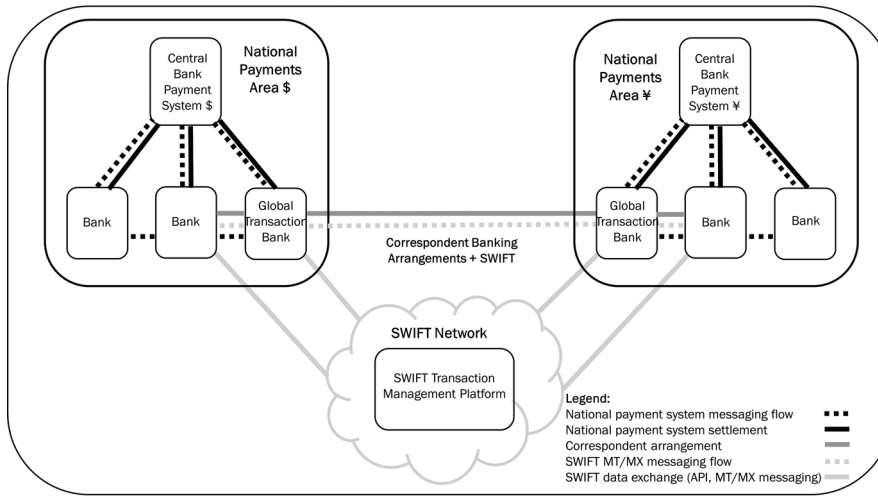

Figure 19.1 Federated global payments system.
Source: Authors' elaboration.

lack of a global currency and central bank means that there is no single global payment system and this 'banal' fact makes cross-border payments more complex (Brandl and Dieterich, 2023).

As per this description, the various national payment systems are connected to each other via correspondent banking (see Nance and Tsingou, this volume). This is a decentralised system of bilateral contractual agreements, called correspondent arrangements or correspondent relationships, between commercial banks operating in different locations. Most banks lack a physical presence overseas and so engage the services of banks elsewhere for international business. For cross-border payments, banks in different locations hold reciprocal ('nostro'/'vostro') accounts with each other from which they make payments. Banks have an arrangement for each currency they make payments in ('currency corridors'). Any bank in one place doing business on behalf of a bank in another place is technically a correspondent; however, transactions are hierarchically concentrated in a small number of mainly Western banks. These banks are called global transaction banks (GTBs). GTBs have a physical presence in many jurisdictions and direct access to payment systems there. Correspondent banking has existed for centuries and remains a mainstay of bank internationalisation as well as a critically important mode of cross-border funds transfer, both for trade and for interbank payments, such as central bank swap lines.

SWIFT's function here, and the reason for its foundation, is providing secure transmission of payment information for correspondent arrangements between over 11,000 banks in more than 200 (para-)sovereign territories. A massive rise in cross-border funds transfers from the 1960s led to Western banks needing standardised, digital, and secure communication for the increased volume of transaction information. SWIFT's messages have become the standard for parts of the finance industry,[3] and these, as well as its network and systems, have gone through various upgrades. Correspondent banking and SWIFT have been derided as legacy systems, ripe for technological disruption. In response, SWIFT has transitioned from serial transmission of messages along the correspondent banking payment chain, towards partial platformisation via a new transaction management platform aimed at helping banks to make economic use of transaction *data* (Robinson, Dörry, and Derudder, 2024).

While cross-border payments messaging is SWIFT's raison d'être and still what it is mostly associated with, SWIFT now processes more messages for securities

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transactions (SWIFT, 2021a). Securities were physical, paper-based instruments until inefficiencies in trading and settlement were exposed by a paperwork crisis on Wall Street in the late 1960s, following a rise in trading volumes. This led to immobilisation and dematerialization of securities, with electronic issuing, custody, and recording and transfer of ownership in accounts at custodian banks and newly created infrastructures like central securities depositories (CSDs). Securities accounts were updated in response to transaction information communicated between parties. The account money form thus also underpins financial asset custody (Chan et al., 2007; Milne, 2016). SWIFT's securities operations began in the 1980s via collaboration with international CSDs on bond transactions. This was followed by the admission of securities institutions as SWIFT members, and the expansion of messaging standards to accommodate further securities transactions (Scott and Zachariadis, 2014), allowing SWIFT to further extend trust beyond payments and serve as an obligatory infrastructural component of international financial flows.

5 Facilitating Trust in Cross-Border Payments

Payment settlement has evolved over time to become consolidated in public central banks (Norman, Shaw, and Speight, 2011). Unlike private entities, states can guarantee the stability of their money's value across space and time (Pistor, 2019). The perceived credibility of this promise makes money 'essentially a relationship of trust' (Brandl and Dieterich, 2023, p. 538). Central bank money is therefore the safest settlement asset and is at the top of the monetary hierarchy (Mehrling, 2013). Beneath central bank money, the majority of money in use is credit money created by commercial banks in a kind of monetary public–private partnership (Ingham, 2020). Private commercial banks have accounts with the central bank where payments are settled: the payment system links public and private money (CPSS, 2003). Lack of trust in money would mean a loss of ability to reliably and confidently conduct everyday social and economic activities that we take for granted, for example, to safely effect payment and to exchange cash for the same amount of money at different commercial banks.

Trust in *domestic* payments is anchored in the central bank as the provider of the unit of account, the final means of settlement, and the guarantor of the smooth operation of the payment system (BIS, 2021). *Cross-border* payments that can include multiple 'long chains' of correspondent arrangements (Campbell-Verduyn, Goguen, and Porter, 2019) are different. In this tightly intertwined network, banks are interdependent by reciprocally holding balances and extending credit (Wandhöfer and Casu, 2018). In the past, based more on reciprocity (Molteni, 2021), trust in the intentions and behaviour of partner banks is now more transactional and controlled via contracts (Lyddon, 2012). Only those banks directly connected to each other have established 'trust' relations over time. Trust, for example, erodes when regulatory violations in a payment chain, for example, anti-money laundering, mean that *all* parties in the chain are liable. The reputational and financial costs of entering into a 'bad' correspondent relationship has led to a decrease in correspondent banking services in a process of de-risking (Prentice, 2019) in recent years. In light of this and other challenges, SWIFT has spearheaded efforts to reorganise its network and correspondent banking to maintain trust in both.

SWIFT's standing is based not on asset transfer, but on security, reliability, integrity, and confidentiality in proprietary financial data, a non-trivial undertaking with the technology available when it was founded. SWIFT's ability to achieve and subsequently maintain this is a key element perpetuating trust in both the organisation and its systems. The quasi-monopoly international payments messaging system, SWIFT also relays *domestic* payments messages for some central banks (CPSS, 2005). It additionally offers them a shared backup generic payment settlement system, the Market Infrastructure

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Resiliency Service (MIRS), in case of a failure of their system, for example, due to natural disaster, cyber-attack, or hardware failure (SWIFT, 2014). SWIFT thereby also helps central banks underwrite trust in their domestic payments. Only the parties to a transaction are able to read messages about a transaction, which SWIFT provides for via authentication and encryption with latest generation IT security. Continuous network uptime and availability for fast and assured message delivery is guaranteed via multiple layers of data-centre resilience, redundancy, physical security, and processes for implementing critical changes, while SWIFT also accepts some liability for its messages (Scott and Zachariadis, 2014).

Trust also comes from the rules that an infrastructure's users abide by diligently. For example, correspondent banking payment messages are only sent once relevant account balances have been updated, meaning that the previous leg of the payment has already been settled (Wandhöfer and Casu, 2018). While types of some messages convey promises, both binding and non-binding, others 'are the very performance promised in the previously or concomitantly issued message' (Kozolchyk, 1992, p. 47). Banks trust that the content of SWIFT messages is correct and untampered with, that the message is genuinely from the sender, and that transactions within have been settled. In this way, individual (local) material conditions extend beyond just the immediate parties to one leg of a longer transaction chain, translating into system-wide (global) trust and performativity.

6 SWIFT: A Club

SWIFT's organisational form is pivotal in co-constituting trust. It combines trust based on established rules and practices as well as on the ability of SWIFT to *enforce* them (system trust) and trust based on individual relationships (personal trust). A way to conceptualise SWIFT is as a club (Buchanan, 1965; Keohane and Nye, 2000; Tsingou, 2014, 2015), which provides an analytical grasp on this complex singular organisation and its relation to trust, power, governance, and its ability to change.

The *first* feature is that of *club goods*. Economics posits the theory of clubs as arrangements for the consumption of goods shared by owner-members. Network effects reduce the cost for a single member (Buchanan, 1965). Spurred by communication technologies, such goods are widespread in financial infrastructures, such as in cross-border payments.

A central driver in SWIFT's creation as a cooperative was a lack of trust among competitor banks. At the time that banks needed a secure, digital communications system, First National City Bank (now Citi) had a messaging system that it proposed all banks use. However, other banks' mistrust of competitor's intentions and of becoming reliant on that competitor's proprietary system was a key reason for a cooperative solution. In the 1980s, Citi envisioned broader usage of its private electronic funds transfer system, which other banks could use, 'but only for a fee and only on Citibank's terms' (Bátiz-Lazo, Haigh, and Stearns, 2014, p. 121). SWIFT's cooperative form engendered organisational trust in its motives and intentions beyond any individual bank's self-interest, while its ability to provide a secure messaging infrastructure created confidence in its *competence* – an important dimension of system trust – rather than in personal trust relations between individual member banks. Shared ownership-usage of SWIFT's messaging system in return for membership fees makes it a club good, while SWIFT's profits are returned to members in the form of cheaper services. For example, the cost of sending a letter of credit by telex in the 1980s was USD 10–25, compared to USD 0.50 by SWIFT (Kozolchyk, 1992). SWIFT's messages have continuously dropped in price, allowing member banks to make large profits. Overall, SWIFT creates benefits for its members by doing things that nobody else will do, such as common provision of unprofitable activities, saving duplicate work and cost. Although SWIFT is not responsible for its members' security, it has

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introduced a security control framework for its users, recognising that hacking incidents are a significant security and reputational problem (Bergin, 2016).

Trust, then, is itself a club good, which generates further benefits. This takes us to the second, social and cultural meaning of clubs as distinct and powerful *communities of practice* (CoP) (Wenger, 1998). Affiliation ties granted by club admission allow the assessment of members' trustworthiness, community commitment, and adherence to norms, even without personal ties or direct interaction as members (Pak, 2013). A specific benefit is collective learning, such as in CoP, which, via an organisation's simultaneous presence in many places, allows the connection of decentralised knowledge, both tacit and codified, and local and non-local (Malecki, 2000). Headquartered in Brussels, SWIFT also has offices around the world, including innovation labs, as well as local country user groups consisting of member bank employees with direct connections to the organisation, allowing SWIFT to 'co-create' with its members (SWIFT, 2021b).

SWIFT's reputation also adds value to its annual Sibos conference, an important community hub (Scott and Zachariadis, 2014). It serves as a field-configuring event (Lange, Power, and Suwala, 2014), at which like-minded individuals from competitor banks can discuss common problems. Collective learning and community fora are thus forms of relational and social capital that help to build interpersonal and, by extension, inter-firm trust among SWIFT members and their employees. However, SWIFT's trusted reputation may not extend evenly within its member banks, but only among employees familiar with it. Operating across many different segments, financial institutions are not monoliths. SWIFT primarily services transaction banking, encompassing areas such as payments and post-trade. Investment banking activities, for example, may use different infrastructures and services.

Thirdly, *gatekeeping* as a specific form of access control is central to clubs. Club goods are not only about inclusion and availability to members. They necessarily involve exclusion to discourage free riding. Inclusion and exclusion are normal features of all kinds of groups and organisations, which the club notion helps to illuminate. SWIFT has three main user categories with different levels of access to SWIFT services:

- supervised financial institutions are entitled to full usage of SWIFT services;
- non-supervised financial industry entities may use almost the full suite of services; and
- closed user groups and corporate entities (including some non-financial firms), which are restricted to using messaging only within certain closed groups.

SWIFT users who are involved in the same business as the other shareholders and who send financial messages are eligible to become SWIFT shareholders; in practice they are mainly licensed/supervised financial institutions such as banks, securities broker/dealers, and investment managers (SWIFT, 2020). Unsurprisingly, there are restrictions on full SWIFT membership and access, given that banking itself functions as a club, with restricted access: state-imposed entry requirements guard the reputation and trust in members, and regulations guide behaviour in a way that benefits all members (Goodhart, 1988). However, at times, powerful members defend existing club boundaries to preserve advantages they enjoy (Stearns, 2011). SWIFT's original member banks were not always keen on allowing new kinds of members to join. While securities firms and infrastructures were admitted in 1987, international fund managers' efforts to join were originally blocked until 1992, while non-financial firms were allowed access in 2002 via closed user groups (Scott and Zachariadis, 2014).

There are always limits to trust, however. While, for example, SWIFT has thousands of member banks, most only own a tiny sliver. Board membership is partly composed according to network usage. This favours the large, mostly Western, GTBs who process most transactions, send most SWIFT messages, and drive SWIFT's

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revenue. Although SWIFT's network has global reach, it features asymmetries in connectivity, sedimented by the legacy of 'particular dispositions within its infrastructural setup and routes, which emerge from past political choices' (de Goede and Westermeier, 2022, p. 6).

A fourth and final aspect of clubs relates to *governance*. Clubs are a model of multilateral cooperation where negotiations and bargaining that produce compromise, decisions, and actions are obscured by being taken in a private setting (Keohane and Nye, 2000). Sheltered from outside influences, the club is a private forum allowing room for competition for influence and ideas, while avoiding conflict and ironing out differences. While this model is usually associated with elites, it is also connected with private authority, in which trust in expertise, experience, and competence leads to legitimate governance based on delegation of technical issues (Tsingou, 2014, 2015). SWIFT's legitimacy as a private authority stems from regulatory oversight by central banks, its cooperative ownership by regulated financial institutions, and from a variety of sources and roles, some of which it has performed for over forty years. These include:

- its function as standards developer/repository and role as an International Organization for Standardization (ISO) registration authority (designated as a competent body by the ISO);
- its status as an accredited market infrastructure; and
- its capacity as community hub and conference organiser for the global finance community.

SWIFT's development and diffusion of its messaging standards has enabled the industrialisation of financial services on a global scale. SWIFT's governance structure is partly organised to grant a country-level voice, from national user groups, ensuring communication between users and SWIFT to keep a global focus, to national member groups of shareholders, to the director voting formula (Scott and Zachariadis, 2014). It is not unusual, however, that the common direction the organisation forges is likely to suit the interests of its most powerful members, in this case the very few GTBs. While SWIFT is therefore a class alliance, it represents the hegemony of a particular transnationally oriented class fraction (Bieler and Morton, 2018).

7 Conclusions

SWIFT as financial infrastructure provides communication, spatial integration, and fundamental functions of capitalism, such as the smooth functioning of exchange, and upholding property rights by keeping records and transfer of ownership. Sometimes cooperatively owned, this infrastructure demonstrates that the very core of financial markets is itself not always market-based. This chapter sought to provide an ordering mechanism to grasp the essences of SWIFT as a monopolistic infrastructure for infrastructures, by mobilising the concepts of trust.

Trust among club members is an essential precondition in mobilising collective strategic action to preserve dominance. Since 2017, in response to fintech challengers targeting inefficiencies in correspondent banking and in SWIFT's legacy messaging system, SWIFT has coordinated and rolled out changes across its network worldwide, thereby building on collective learning among its members. As demonstrated in this chapter, system trust is a key part of the connective tissue of infrastructure.

SWIFT has also been reluctantly involved in geopolitical controversies. In 'the SWIFT Affair', there was uproar that prompted a reconfiguration of SWIFT's data centre locations (Dörry, Robinson, and Derudder, 2018) after SWIFT allowed US authorities access to transaction data, including of European Union (EU) parties, following the 9/11 terrorist attacks in New York (de Goede, 2012). Financial sanctions on cross-border payments can be enacted in two ways: one involves targeting the information component, SWIFT, while the other involves targeting the settlement component by

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banning correspondent banks from processing currency transactions on behalf of banks in the issuer country (Robinson, Dörry, and Derudder, 2023). SWIFT has been forced by the USA and EU to disconnect banks in, amongst others, Iran on two occasions and Russia in 2022. While SWIFT wishes to remain neutral and to avoid disconnecting members and countries, its near-monopoly messaging infrastructure is a choke point that can be leveraged as a political tool.

Due to the possibility of future sanctions, certain countries are reducing USD dependence. They use alternative currencies and clearing/settlement systems, as well as alternative financial messaging systems to SWIFT (see Nölke, this volume; cf. Nölke, 2023). Established in the 1970s, SWIFT is a child of the post-1945 Bretton Woods cementing of USD hegemony, cross-Atlantic Eurodollar flows, the beginnings of financial globalisation, and the attendant dominance of Western banks, who crafted their private financial infrastructure according to their needs. A shift towards a multipolar monetary order will see attendant new financial infrastructures and shifts in existing infrastructure (see Westermeier and de Goede, this volume).

Challenges to SWIFT's primacy in financial communications are not only about geopolitics/geo-economics, but also purportedly about economic efficiency and financial inclusion, for example, the United Nations sustainable development goals aim of reducing the cost of remittances. While SWIFT has recently upgraded its messaging infrastructure to compete in the digital platform era, other fintech challenges remain. The first is a nascent trend towards direct bilateral and multilateral interlinking of central banks' national payment systems with the aim of improving cross-border payments efficiency, but with the possible effect of bypassing correspondent banking arrangements and SWIFT. A further challenge is from a new money form based on cryptocurrency, namely digital tokens on distributed ledger technology (DLT)/blockchain. While new technologies like blockchain have raised questions about trust in finance, they have not succeeded in their aim of removing trust entirely (Campbell-Verduyn and Goguen, 2019). Incumbent banks, infrastructures, and central banks have incorporated the technology to make financial transactions more efficient through 'tokenization' of money and securities. This money form features 'atomic' instant combined communication and settlement of transactions, without the separate processes inherent in account-based money. It may thus replace existing financial infrastructures, including SWIFT, with entirely new DLT-based infrastructures.

Infrastructure consists of both technical 'hardware' and social 'software', including organisations in which it is embedded. SWIFT's centrality as an infrastructure for infrastructures is not neutral but contingent on and enrolled in larger power struggles, which inform attempts to change it. Examining the money form(s) that financial infrastructures support allows us to speculate about potential infrastructural futures of new money forms. Change is inevitable, and understanding how this complex twin infrastructure of SWIFT and correspondent banking will navigate these challenges remains an exciting task for the future.

Notes

1. Clearing and settlement follow the execution of every transaction and vary depending on the market, instruments, parties, and infrastructures involved (Lee, 2011). Generally, clearing refers to a series of processes post-trade and pre-settlement, including establishing the parties' obligations to each other and the potential transfer of obligations to a central counterparty to mitigate risk. Settlement is an event that follows clearing, in which the agreed exchange of ownership for money happens (Milne, 2016).
2. Here, the term 'payment system' refers to an interbank payment system 'incorporating a particular set of payment instruments, technical standards for the transmission of payment messages and an agreed means of settling claims among system members, including use of a nominated settlement institution' (CPSS, 2003, p. 9).
3. Different parts of the industry use different messaging standards and protocols.

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