



Information paper

**Cross-border securities
market infrastructure links**

Lessons and perspectives for
Asia Pacific

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Executive Summary

Endeavours to link global markets through shared platforms, partnerships and alliances are increasingly commonplace. Conjointly prevalent is the growth of strategic cross-border links between securities market infrastructures. A number of events are steering securities market infrastructures in this direction, notably renewal of operating technology and systems and expansion of business and service offerings. Furthermore, their involvement in national or regionalisation initiatives, adherence to new regulation and adoption of international best practices are at the helm of expanding market infrastructure collaboration.

This information paper summarises the involvement of SWIFT in supporting a number of successful cross-border projects between market infrastructures. It sets out a number of observed critical success factors in market infrastructure link initiatives. Among these, are transparent organisation and planning structures; and robust and cost effective technical solutions; both of which have the potential to enrich the current offering of a market infrastructure. Other factors fuelling successful links are harmonised standards market practice, coordinated connectivity user groups and rigorous community and stakeholder engagement at every stage of the initiative from its onset through to service launch.

SWIFT continues to be an integral part of the Asia Pacific financial fabric and in its role as an industry cooperative, is committed to fostering economic integration towards the continuous growth of the region. This paper focuses on the financial securities markets. It describes the end-to-end SWIFT offering that securities market infrastructures and communities alike can collectively leverage to enhance global financial transaction flows; and thus derive seamless, efficiency gains and economies of scale in support of their strategic cross-border initiatives.

1 Introduction

While markets are flooded with a myriad of innovative technology solutions aimed to improve business and process transactions, financial market infrastructures remain fundamental to any market development. Over the past decade, SWIFT has observed a prevalent trend to eliminate barriers to cross-border transactions through partnerships between securities market infrastructures (SMIs), shared platforms and the formation of strategic SMI links across borders.

Encompassing different business segments and supporting various market motivations, common drivers of these initiatives are:

- **New systems.** To remain competitive in today's marketplace, SMIs are investing in timely replacement of legacy technology and platform renewal. Often these projects incorporate the ambition to modernise existing systems and to reduce dependencies of proprietary infrastructures. Moreover, they encompass the goal of lowering cost of market entry and adoption of international financial standards. This wave of platform renewal and system enhancements of SMIs also prioritises enhanced resiliency, reliability and interoperability, to facilitate cross-border and international access to economies. Concurrently, market infrastructures (MI) are in constant pursuit of operational efficiencies, economies of scale and improved risk management.
- **New initiatives.** Recent years have witnessed a renewed and revitalised drive to regionalise or interconnect markets. Among the initiatives in the Asia Pacific region, the ASEAN financial integration ambition has been renewed through the ASEAN 2025 vision and its roadmap for an ASEAN Economic Community (AEC)¹. As with other regionalisation efforts, it is backed by overarching government

mandates which feed into economic growth. Many of these regionalisation or internationalisation initiatives encourage the interoperability of infrastructures or development of regional infrastructures with the objective to facilitate vertical and/or lateral links among MIs and their participants.

- **New regulations.** Following past financial crises, there is a collective commitment from global policy makers to drive regulatory changes towards more robust monitoring, operational and risk management. At a global level, the CPMI-IOSCO Principles of FMIs² (PFMI) is an example of guidance at a common base level of operational risk management for financial MIs. Furthermore, within regional groupings such as the EU, ASEAN, ASEAN + 3³ and the wider Asia Pacific region, regulators continue to strongly support global inter-operability and the ambition of respective participating member countries to expand internationally or to facilitate foreign participation.
- **New businesses.** Influenced by technology evolution and the shift of traditional market boundaries and strategies aimed at penetrating new businesses, is a triggering demand for new or enhanced business services to cater for cost effective, cross-border transactions. Consequently, market operators and infrastructures are expanding their service functionalities to include end-to-end business processing (e.g. regulatory reporting), introduce value added services into key business flows (e.g. straight-through-processing service of corporate announcements from a golden source, funds order processing and administration); and

building linkages with foreign participants (e.g. mutual recognition arrangements and regional processing platforms). In doing so, business and service offerings to domestic markets or core traditional activities are unconfined.

- **New standards.** Recognising the above drivers and trends, there has also been a call for adoption of financial standards and harmonisation of market practices. This has accelerated the speed of adoption of international standards such as ISO 20022 within the Asia Pacific region. Also driving adoption, are the lowering of transaction barriers and incorporation of standards into regulations and mandates of other regions, such as in the EU.

As part of its developmental role, SWIFT has been supporting both SMIs and their participants for domestic transformation projects as well as for SMI led initiatives to establish links with their peers across borders and regions. There is no one-size-fits-all implementation structure for SMIs when establishing these links. Derived from observation of and experience with major cross-border infrastructure projects, SWIFT considers a number of core components essential for success. These include robust organisation and planning, standardisation, operational viability, implementation requirements, transparent project plans; as well as community and stakeholder outreach and buy-in.

Further details of these components and examples of strategic cross-border infrastructure projects where SWIFT has played a prominent role, are shared in the following sections of this information paper.

¹ ASEAN 2025: Forging Ahead Together, 2015, Source: <http://asean.org/asean-2025-at-a-glance/>

² CPMI-IOSCO Principles of Financial Market Infrastructures, 2012

³ ASEAN + 3 refer to the 10 member countries of the Association of Southeast Asian Nations with China, Korea and Japan

2 Cross-border market infrastructure links and SWIFT

Cross-border links can be direct, unilateral, bilateral or indirect. For instance, in the case of central securities depository (CSD) links, it is an arrangement allowing a CSD to give its clients access to securities issued in another CSD, without requiring these clients to be direct participants in the other CSD. Hence, links contribute to market integration by facilitating cross-border securities delivery.

The following section provides examples of existing and on-going MI cross-border links and highlights how SWIFT has contributed to their development.

MI and its community

Year	Project
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1980s	International Central Securities Depository (ICSD). Driven by market demand, globally recognised ICSDs Euroclear and Clearstream have established cross-border links with domestic markets to enable their participants to settle securities transactions in those markets.
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SWIFT has long supported activities of ICSDs and is used by the global participants of Euroclear and Clearstream for their dealings with domestic markets either through agent banks or directly with other CSDs.

Market participants can connect to these ICSDs and access their services through SWIFT connectivity options. For many participants, it is an opportunity to leverage their SWIFT infrastructure. Both Euroclear and Clearstream are users of the standards management tool, MyStandards, and share their messaging content on this collaborative web platform.

1990s	Euroclear UK and Ireland CREST system (CREST). The CREST system of Euroclear UK & Ireland is the real-time settlement system for UK, Irish and international securities and governments bonds. The CREST system supports multiple currencies and offers its members other related services such as delivery versus payment (DVP), securities borrowing and corporate action processing.
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SWIFT has been an accredited network services provider to users of CREST since its inception. Through its standardised network, SWIFT offers CREST users a single interface to all features of the securities settlement value chain.

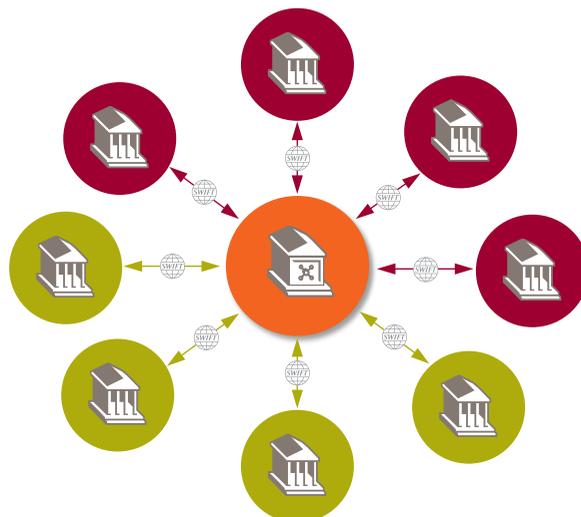


Figure 1: A SMI and its domestic and international community

A many-to-one model where the focal SMI can either be a domestic infrastructure (e.g. CSD) or an international infrastructure (e.g. ICSDs).



Cross-border bilateral links

Year	Project
2014	Stock Connect – Hong Kong, Shanghai, and Shenzhen. Stock Connect is a securities trading and clearing link between the Hong Kong Exchange and Clearing Limited (HKEX), the Shanghai Stock Exchange (SSE), the China Securities Depository and Clearing Corporation Limited (ChinaClear) and the Shenzhen Stock Exchange. Stock Connect allows international and Mainland Chinese investors to trade securities in each other’s markets through the trading and clearing facilities in their home exchange. An order-routing connectivity and enhanced technical infrastructure was put in place to facilitate mutual access to respective markets in order to trade selected equity listed securities such as China A-shares.

Although SWIFT did not directly contribute to the establishment of Stock Connect, SWIFT supported the initiative by collaborating up-stream with asset managers, global custodians and the sub-custodian community to help establish clear market practices. A ripple effect of this is a cost effective, straight through post-trade process from foreign investors down to the SMI.

2017	Bond Connect – China. A mutual market access bond trading link scheme that enables investors from Mainland China and overseas to trade in each other’s bond markets through connections between the related Mainland and Hong Kong financial infrastructure institutions. Bond Connect started with Northbound Trading, enabling inward investments in the China Interbank Bond Market (CIBM), through mutual arrangements in trading, settlement and custody. Southbound Trading will be explored at a later stage.
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Since the launch of Bond Connect, SWIFT has been working with the post-trade infrastructures to standardise and automate the settlement and asset servicing flows between Mainland China and Hong Kong.

Not limited to the Bond Connect initiative, there is a strong call for harmonisation of standards and documentation of market practices in Mainland China. Predominately this is due to the complexity of the Chinese capital markets framework and multiple SMIs. An avenue for harmonisation could be the participation of Chinese MIs to market practice forums that are facilitated by SWIFT; such as the National Market Practice Group (NMPG) and the Securities Market Practice Group (SMPG). This would be a beneficial stride for China towards the adoption of international data and messaging standards such as ISO 20022.

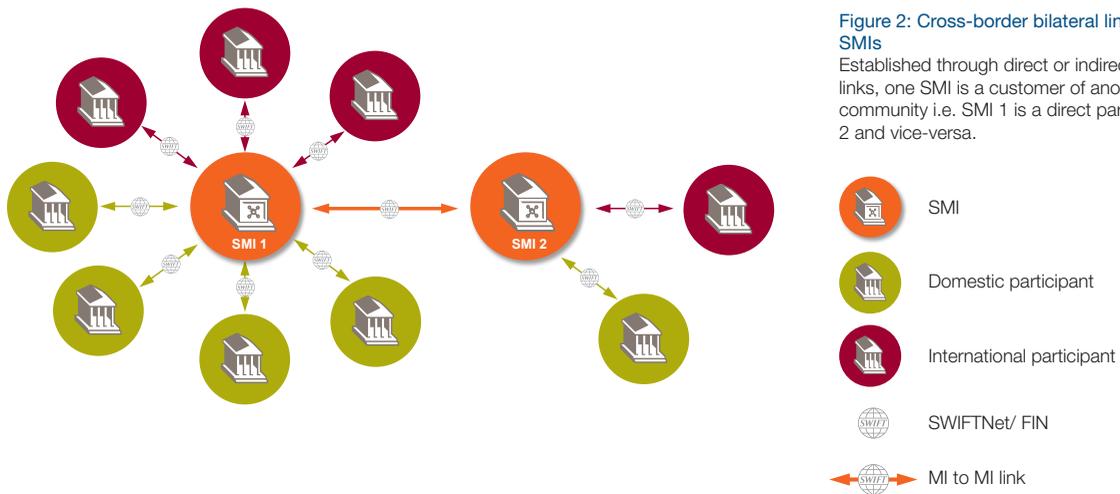


Figure 2: Cross-border bilateral links between SMIs

Established through direct or indirect links. In direct links, one SMI is a customer of another to serve its community i.e. SMI 1 is a direct participant of SMI 2 and vice-versa.

Multi-market or regional structure

Year	Project
2013	<p>South African Development Community (SADC). In conjunction with objectives to boost socio-economic development in the region, the 15 SADC member countries worked towards developing a common electronic payment and securities settlement system named SADC Integrated Regional Electronic Settlement System (SIRESS).</p> <p>SWIFT is a network provider to SIRESS and from the outset, also played an essential role in this regional project. SWIFT assisted the community in defining and documenting messaging standards, and conducting reviews to assess market participants' operational and technical readiness. Also provided by SWIFT, is fully customised training, consulting services and administration of an associated Closed User Group (CUG).</p>
2015	<p>TARGET2-Securities (T2S). T2S is a single, pan-European platform for securities settlement in central bank funds. The single platform is operated by the European Central Bank (ECB) and it enables CSDs in Europe to outsource their settlement operations to the ECB. This large scale post-trade initiative was implemented with the objective to harmonise settlement processes, reduce intermediate costs, whilst increasing competition and improving risk management.</p> <p>SWIFT has a longstanding strategic commitment to support European harmonisation efforts and is one of two organisations that provide value added network (VAN) solutions to T2S. Since the start, 95% of T2S Directly Connected Actors (DiCoAs) have migrated to T2S using SWIFT's VAN Solution⁴. The SWIFT VAN solution now carries live traffic for more than 150 users⁵ on the new pan-European securities settlement platform. SWIFT also provides extensive standards related assistance such as, strategy development, impact assessment, specifications review, message development, maintenance, and testing and support.</p> <p>To enable consistent publication of the specified standards, facilitate deployment, maintenance and integration efforts throughout the financial industry, T2S message specifications are published on MyStandards. In addition, DiCoAs are also able to test their T2S messages using the complementing MyStandards Readiness Portal service.</p>
	<p>On-going Cross-Border Settlement Infrastructure Forum (CSIF). The CSIF is an initiative driven by participating central banks and CSDs from ASEAN+3 member countries, which aims to facilitate discussions on the improvement of cross-border bond and cash settlement infrastructures in the region. CSIF's efforts include exploring the development of a Regional Settlement Intermediary (RSI). A CSD-RTGS Linkage is currently being discussed to enable local bonds in a country to be settled in delivery versus payment (DVP) via central bank funds. In these discussions, planning and designing of the RSI is based upon eight basic principles identified by the CSIF⁶.</p> <p>SWIFT contributes to the ASEAN+3 Bond Market Forum (ABMF) and the CSIF as an observer and international standards expert. SWIFT is looking forward to being able to support the implementation of the pilot cross-border link use cases identified by the CSIF.</p>

⁴ <https://www.swift.com/news-events/press-releases/landmark-final-wave-sees-four-more-csds-go-live-on-t2s-using-swift>

⁵ Includes CSDs, Central Banks and Directly Connected Participants

⁶ Basic Principles on Establishing a Regional Settlement Intermediary and Next Steps Forward, CSIF, ADB, 2014
Progress Report on Establishing a Regional Settlement Intermediary and Next Steps, CSIF, ADB, 2015

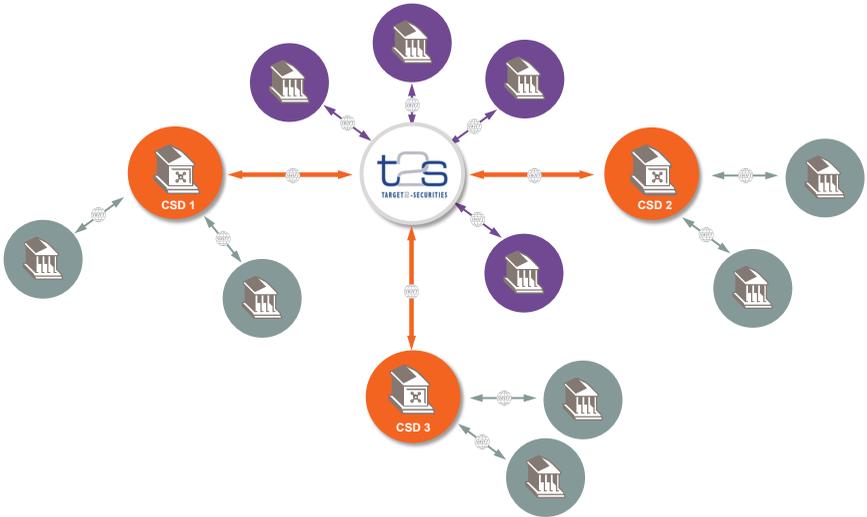


Figure 3: Multi markets structure with a central SMI e.g. T2S

A centralised shared infrastructure to serve participating SMIs with direct and indirect participants

-  SMI
-  Directly connected participant
-  Indirectly connected participant
-  SWIFTNet/ FIN
-  MI to MI link

3 Core components to support cross-border market infrastructure links

Establishing a cross-border market link is a complex journey encompassing multiple phases, milestones and requirements, all of which come with their own challenges. Among the most cited is the need to account for the different levels of a country's economic development, financial market maturity, regulatory framework and infrastructure complexity of participating markets. These challenges are often compounded when there is a necessity to also consider operational priorities such as implementing an interoperable solution, and ensuring high levels of infrastructure security, reliability, resilience and safety.

Although each SMI project will have unique requirements and objectives, especially when they involve cross-border linkages, some key elements are essential to ensure well planned, secure, efficient, competitive and standardised cross-border links for SMIs. Among these elements are:

Organisation and Planning

- MI and participant groups should align and agree on clear goals and objectives for the project. This can be achieved through consultative strategy development and roadmap planning.
- Robust gap analysis reviews and impact assessment should be performed in the development of a clear implementation roadmap for participating markets. The review should encompass business, regulatory, technical and standards perspectives. The implementation roadmap and standards adoption guides should be applicable to both SMIs and their communities.
- Stakeholder support and clear public commitment from regulators, policy makers and related government bodies, are crucial to ensure continuous market wide support.
- Clear governance, oversight and administrative frameworks are needed to take into account the different regulatory and supervisory authorities of participating markets. While this may result in complex frameworks, it is important that information on governance of cross-border arrangement is widely communicated in a transparent manner.

Technical Structure

- Technical recommendations should accommodate future volume growth, extensions into new business segments, services and customer groups. The implemented technical solutions should have a level of flexibility to support different business and operating models as well as scheduling of linkage implementation by the participating SMIs and their community; be it a big-bang or phased-in approach.
- With a view for cost and operational efficiencies, where possible, consider scalable solutions, reuse existing systems and utility infrastructures. This may be an alternative to developing bespoke bilateral links that could translate into complex maintenance activities, high operational and implementation cost for participating market structures.
- System resiliency and reliability are of utmost importance for cross-border arrangements, such as business continuity, disaster recovery and system interruption recovery. Operational reliability and resilience of robust infrastructures should be considered in accordance with or beyond international best practice, suitable for the envisioned end state of a linkage arrangement.

Standards Market Practice

- SMI link projects should use internationally recognised financial messaging and reference data standards, which are suitable for both domestic and cross-border financial communication.
- Using international standards such as ISO 20022, SMI link projects can leverage the flexible and open data standards, with features that facilitate interoperability, improved levels of transparency, transaction visibility and data richness intersecting all financial business domains.
- The agreed standards specifications and recommended flows for the participating SMIs and their communities should be documented and consistently disseminated through an easily accessible platform or channel.
- Aside from adhering to international market practice, SMIs are encouraged to ensure that message versions of the cross-border initiative are updated with the latest versions in a timely fashion with reference to message release cycles. This is one of the principal axes of the ISO 20022 Harmonisation Charter⁷ (the Charter). The Charter also provides a good platform for peer exchange of information, lessons learnt and fostering dialogue on ISO 20022 adoption activities.

⁷ More information is available at <https://www.swift.com/standards/iso-20022-harmonisation-programme>

Community Involvement

- Community involvement should commence from the earliest stage of any cross-border SMI link initiative. Engagement could range from seeking industry input for the business case for such an SMI linkage use case (this is key to garner support of end users); to providing periodic public progress updates of the project implementation. Avenues for community engagement can be via dedicated working groups of the SMI and its members, to specific industry forums or National Member Participant Groups (NMPGs).
- With clarity on requirements and implementation plans, both domestic and international market participants will be able to allocate appropriate internal investment and resource planning.
- Community training and workshops are a must to ensure common understanding of the benefits of the end product and how it to optimise its use across borders.
- Not limiting engagements to its direct members and linked infrastructures, SMIs can also contribute to dialogues and engagement with peers, as well as efforts to provide a more holistic view on the developments of cross-border SMI links.

Managed User Groups

- Should a cross-border community of SMIs with one or several SMIs need to be defined for access and operational purposes, a managed user group should be developed precisely for this purpose.
- Managing cross-border link initiatives through managed participant or user groups can assist with monitoring activities of the proposed connectivity framework and its implementation in order to efficiently and securely coordinate the targeted community.
- From a SWIFT connectivity framework perspective, Closed User Groups (CUG) can be implemented and administrated by SWIFT. This offers additional security as the CUG only permits the exchange of messages between identified members and of a defined set of messages as specified within the CUG.

4 Leveraging SWIFT for SMI cross-border links and community development

More than 100 SMIs across the globe have leveraged their SWIFT infrastructure as part of both their domestic and cross-border growth journeys. SWIFT is committed to continuous development of financial markets, and seeks to reinforce its core values through diverse, important community related initiatives and programmes. Some examples of such programmes include:

SWIFT launched a dedicated **Customer Security Programme (CSP)**⁸ to support its community of users to strengthen security of their SWIFT related infrastructure. The programme is articulated around three mutually-reinforcing areas where (i) customers need to secure and protect their local environment, (ii) take steps to prevent and detect fraud in their commercial relationships, and (iii) contribute to information sharing throughout the community.

Comprehensive and flexible SWIFT **Connectivity Solutions** can be easily adapted to most proposed cross-border link

models. Fully interoperable, these solutions can be tailored and offer scalability according to specific SMI requirements. For some cross-border SMI link models, it is an opportunity for SMIs to reuse their existing SWIFT infrastructure to establish the envisioned link in an operational and cost effective manner. Leveraging an existing infrastructure could also translate into time saving efforts during the implementation process building on current levels of knowledge, resource and skills. Moreover, to help alleviate the challenges of migrating to international standards, SWIFT has introduced the **SWIFT Translator**, which enables a message translation service from any message format to ISO 20022 or MT.⁹

In order to support the SMI community, SWIFT has designed simple competitive packages that offer messaging, standards and products and that meet the service requirements of such initiatives. A good example is the **SWIFT CSD Community Offering (CCO)**¹⁰, which is available for communications between

domestic CSDs and their direct participants over SWIFT using either FIN or SWIFTNet Interact. The CCO scheme allows CSDs and their direct participants to further leverage their current investment in a SWIFT channel and to obtain competitive messaging prices. A many-to-many **Inter-CSD link solution** over FIN with ISO 15022 and SWIFTNet Interact for ISO 20022 is also available, and provides CSDs with the ability to connect across borders with other CSDs, through a SWIFT administrated CUG, which includes message validation services.

With respect to **Standards**, SWIFT often plays an important role of catalyst in uniting the financial community to collaboratively shape market practices, define standards and resolve community challenges. Aside from being a trusted source of standards expertise, SWIFT drives global discussions focusing on standards related issues that are impacting SMIs and their communities. The MI Forum¹¹ and initiatives such as the ISO 20022 Harmonisation Charter are examples.

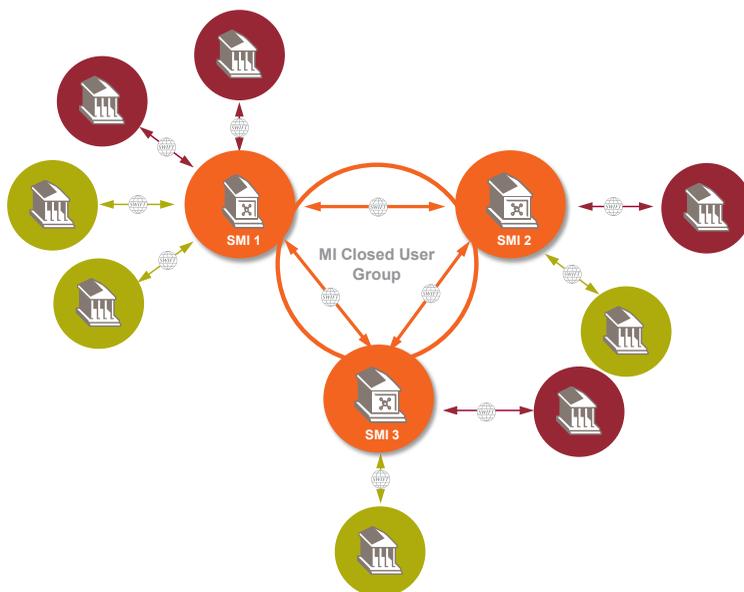


Figure 4: Facilitating a multi-market structure with SWIFT

SMI and participants leverage SWIFT's global reach and their SWIFT infrastructure to establish cross-border SMI links. Multiple bilateral links can be managed under a common access environment such as CUGs. Jointly agreed message sets using international standards, can be defined for the initiatives.

⁸ More information is available at <https://www.swift.com/myswift/customer-security-programme-csp>

⁹ More information is available at <https://www.swift.com/our-solutions/compliance-and-shared-services/mystandards/swift-translator>

¹⁰ More information is available at https://www.swift.com/insights/news/what_s_new_for_csd; https://www.swift.com/news-events/press-releases/swift-enhances-connectivity-to-vps_the_norwegian_central_securities_depository; <https://www.swift.com/news-events/press-releases/swift-harmonises-bank-connectivity-to-vp-securities-using-iso-20022-standards>

¹¹ More information is available at: <https://www.swift.com/our-solutions/imi-forum>

5 Conclusion

Across Asia Pacific, there is a flourishing trend to establish cross-border SMI links as an integral part of market development strategy. In most cases, these links are established with the objective to reduce trade barriers and to facilitate greater market integration. Whilst the majority of these initiatives are driven by SMIs, there are key components and critical success factors that should be considered from the earliest possible stage of the project.

For both SMIs and their participants, there are multiple advantages to leveraging SWIFT capabilities in this area. As a member-owned cooperative, SWIFT has an extensive and proven track record in supporting the design and delivery of large complex SMI projects. SWIFT provides robust, reliable and secure messaging solutions to hundreds of securities and payments infrastructures globally, across three continents. As well as being able to use standardised messaging solutions and value added services, market participant can reuse their existing SWIFT infrastructure to multiple SMIs and achieve significant economies of scale.

By offering end-to-end assistance, ranging from standards expertise to designing secure, forward looking technology solutions, SWIFT is uniquely positioned to support SMI initiatives in Asia Pacific and beyond. Furthermore, SWIFT supports standardised community programmes, which provide participants the latest market wide solutions, communication channels and message standards.

Every day, SWIFT supports a prospering Asia Pacific region by enabling SMIs to process their financial transactions flows, mitigate risk, increase operational efficiency and ultimately pass on the benefits of reduced costs and risks to their participants.



About SWIFT

SWIFT is a global member-owned cooperative and the world's leading provider of secure financial messaging services. We provide our community with a platform for messaging, standards for communicating and we offer products and services to facilitate access and integration; identification, analysis and financial crime compliance. Our messaging platform, products and services connect more than 11,000 banking and securities organisations, market infrastructures and corporate customers in more than 200 countries and territories, enabling them to communicate securely and exchange standardised financial messages in a reliable way. As their trusted provider, we facilitate global and local financial flows, support trade and commerce all around the world; we relentlessly pursue operational excellence and continually seek ways to lower costs, reduce risks and eliminate operational inefficiencies. Headquartered in Belgium, SWIFT's international governance and oversight reinforces the neutral, global character of its cooperative structure. SWIFT's global office network ensures an active presence in all the major financial centres.

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