WORLD ALLIANCE
of International Financial Centers

ENHANCING SUPPLY CHAIN FINANCE FOR THE PROMOTION OF THE GREEN TRANSFORMATION

WHITE PAPER

IMPRINT

World Alliance of International Financial Centers (WAIFC)
International non-profit association
208 Avenue Louise, 1050 Brussels
Belgium

www.waifc.finance
@WAIFC_
info@waifc.finance
www.linkedin.com/company/waifc

Publication Date:

09 May 2024

Workstream Coordinators:

FinCity.Tokyo
Frankfurt Main Finance

Other Contributors:

Abu Dhabi Global Market
Casablanca Finance City
Dubai International Financial Centre
EnterpriseNGR
FinanceMalta
Paris EUROPLACE
Surecomp Japan

Picture Credits:

Shutterstock

All charts created by FinCity.Tokyo

WORLD ALLIANCE
of International Financial Centers

Contents

PREFACE

When WAIFC was established in 2018, our key assumptions were:

1. The world economy will be increasingly interconnected;
2. Almost all jurisdictions are enthusiastic to promote the green transformation of their economies and environments.

These assumptions are no longer valid.

WAIFC is a unique institution in which both developing and emerging economies, Eastern and Western, are able to collaborate harmoniously with one another.

WAIFC's role is to ensure that financial centers are working together to provide sufficient funding and knowledge for the green transformation of end-to-end supply chains.

Given that various small and medium-sized suppliers are involved throughout supply chains, we need to employ cost-efficient technologies to ensure transaction transparency.

Obviously, this is highly challenging, and no single financial center can resolve the issues alone.

WAIFC launched this initiative in 2020 after the emergence of COVID-19 and the eruption of the war in Ukraine, both of which led to supply crunches in the existing supply chains of many goods and resources. We looked for solutions, but soon, we realized that there would be no silver bullet.

Rather, we have to continuously explore opportunities and exchange ideas in order to achieve common goals among very different financial centers.

Thanks to the WAIFC members who shared their experiences, case examples, and lessons learned in developing this white paper.

I hope that readers will discover important insights and takeaways from their activities.

Keiichi Aritomo

Chairman, WAIFC

INTRODUCTION

In this white paper, we will discuss the role that finance can play in supporting global supply chains to meet the challenges of today. Global supply chains grew rapidly over the years of globalization, but they have started to take on new roles in evolving economic and financial situations. In particular, the implementation of the transition strategy in order to achieve net zero greenhouse gas (GHG) emission targets through supply chains is becoming an important challenge. WAIFC members have discussed the roles of financial markets and measures in mitigating the associated risks. They have also explored various approaches so that such measures can be adapted flexibly to align with the conditions across different economies.

In the first chapter, we will discuss the general background of undertaking finance for supply chains (hereafter referred to as supply chain finance or SCF) as a research topic and review the challenges.

Background

As the globalization of economic activities made great strides in the early 21st century, the majority of developed and developing countries became deeply interdependent in a cross-border network of supply chains involving an international division of labor, horizontally and vertically. These developments contributed to the rapid growth of the global economy by reducing costs and improving efficiency.

Most recently, the global pandemic and geopolitical tension have shed new light on the economic importance of supply chains and the need for resilience. This is evidenced by the various efforts being made by many governments and firms to enhance their supply chains to meet new demands, including the security of strategic materials and the maintenance of sustainable economic growth.

At the same time, preventing climate change is becoming an increasingly urgent task as abnormal weather patterns become increasingly frequent. As a result, coupled with the changes in economic conditions, the “transition” approach is gaining support not only in Asia, where there is a high density of “hard-to-abate” industries and a quick transition to “Green” is unlikely, but also in Europe.

Containing global warming requires collective action to harmonize the efforts of the various economies and firms that comprise supply chains. At the same time, measures are needed to prevent the costs and risks of decarbonization from being unfairly reallocated to developing countries and SMEs.

Taking into account the above points, WAIFC members engaged in a discussion on how finance can contribute to solving supply chain problems, with the main focus being the transformation of economic activities to prevent climate change (hereafter referred to as Green Transformation, or GX) by compiling insights from various economies.

The point of shared interest was increasing the sophistication of financial services and processing information by utilizing digital technologies.

Despite the concern that WAIFC members may have too wide a variety of views about the present situation with regard to the digitalization of finance, in reality, digitalization has wide applicability for developed and developing countries alike. Beyond the benefits of enhancing financial inclusion and universally distributing indispensable financial services, digitalization can also be an advantage for developing countries since digitalization is easier for those countries. These economies are free from legacy financial platforms, whose replacement or reconstruction may pose issues for developed economies despite the reduced initial cost of digital technologies.

Digitalization occupies an important place in the growth strategies of many economies. Among all of these, the digitalization of financial services plays a special role in helping to achieve sustainable economic growth. At the same time, efforts are being made to digitize Supply Chain Finance by new financial players, such as FinTech companies and trading companies, in addition to existing providers of financial services, such as banks and investment banks.

Relevant International Regulatory Frameworks and Initiatives

A number of relevant regulatory frameworks have emerged, and initiatives are taking place. For example, the Carbon Border Adjustment Mechanism (CBAM) is the EU's tool to put a fair price on the carbon emitted during the production of carbon-intensive goods entering the EU and encourage cleaner industrial production in non-EU countries. This is a major tool being progressively implemented in the EU, and it will be completed by 2026 to avoid carbon leakage, ensure a green level playing field, and put a price on gas emissions. This will have an important impact on the greening of cross-border supply chains, particularly for all emerging countries and firms involved in the value chains.

In addition, the new disclosure standards of the International Sustainability Standards Board (ISSB) require scope 3 disclosure (although the US SEC recently kept it outside of its regulation), which could also impact the monitoring/reduction of gas emissions through the supply chain.

While these regulatory frameworks and initiatives are instrumental, they are also overwhelming for small and medium-sized enterprises (SMEs) to adhere to these frameworks and initiatives because:

- There are many bodies driving relevant initiatives
- SMEs do not have sufficient internal human resources to monitor, understand, and implement these emerging rules and regulations
- They are rather struggling with their day-to-day working capital financing

Existing Problems

Having reviewed the background, this white paper sets out to discuss the common features and challenges faced by the economies of WAIFC members. The focus is on enhancing supply chains for Green Transformation purposes while keeping in mind a variety of economic and financial structures. Based on this, we will present a menu of options for empowering the financial market, as well as financial measures that can be employed in a tailored manner, reflecting respective situations. More concrete questions are:

1. What are the conditions for realizing the Green Transformation through supply chains?
2. How should SCF for the Green Transformation be financed?
3. What are the advantages of SCF for the Green Transformation?
4. How should we produce and utilize digital information in supply chains?
5. What are effective policy measures for activating supply chain finance?

Definition of Supply Chains

Before entering a detailed discussion, it is important to clarify the definition of supply chains in this white paper. Generally, “supply chains” refers to the continuous steps in the manufacturing of goods and their logistics processes. This white paper relies on this standard definition but extends it in some respects.

Firstly, the supply chains in this white paper include not only goods but also services. Today, a wide range of services circulate through supply chains, such as computer programs and animation graphics.

Secondly, this white paper's scope of supply chains extends beyond borders and includes cross-border supply chains. As an international forum, WAIFC finds it pertinent to discuss supply chains from the perspective of mutual collaboration. At the same time, as many of the issues of supply chains overlap with those of SME finance, enhancing supply chains within each economy is also important.

Thirdly, we include the industry structure in the scope of our discussion. A standard understanding of supply chains focuses on the chain of manufacturing and logistics processes of a single commodity. In reality, many industries are involved in the production of a good or service. Consequently, implementing supply-chain-related measures requires capital investments and innovation at the industry level. In this white paper, we also cover this area as an issue of supply chains, which are alternatively called industrial chains. That way, we believe we can coherently cover the role and significance of finance.

SUPPLY CHAIN FINANCE FOR SMES

The relevance of SME finance

SCF is relevant as a practical case of SME finance, which was the subject of last year's WAIFC research.

In either developed or developing countries, small and independent companies (usually B-to-C businesses) tend to lack access to indispensable financial services for business, such as depositing, lending, and sending. These are the major issues for SME finance.

Looking from different perspectives, SMEs in many industries, especially manufacturing, operate as part of domestic and/or cross-border supply chains. These companies tend to enjoy relatively stable transactions and other benefits, such as provision from buyers of cash and credit (such as issuing LCs). In this sense, these companies seem to face relatively fewer financial problems.

Having said that, financial support from buyers usually does not reach further than high-tier suppliers, and, in reality, lower-tier suppliers (both domestic and foreign) often end up facing the same SME finance issues.

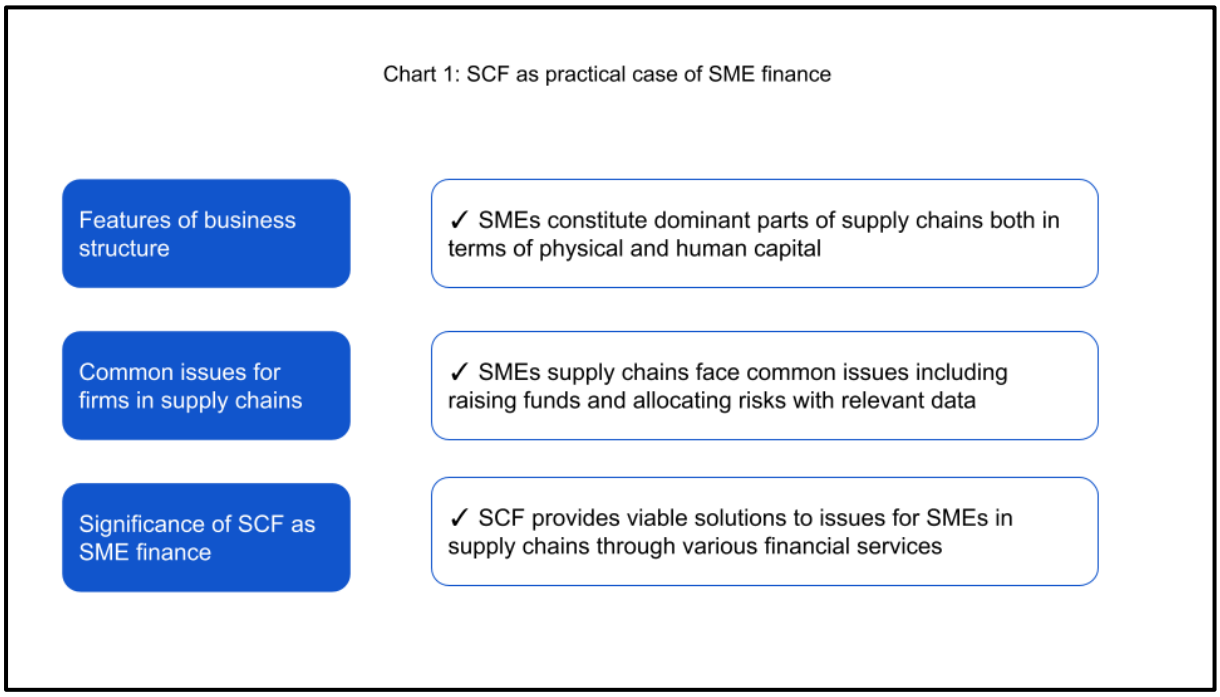
With the expansion of supply chains across a range of industries in recent years, more suppliers are expected to face similar SME finance issues. This is even more the case in industries where SME suppliers play a larger role, but the collateral value is lower. A representative example would be the food processing industry.

As the global economy is exiting low-interest rate environments, even large-scale buyers, usually headquartered in developed countries, are forced to review their support for suppliers through financial means. Even for them, financial support may force them to maintain excessive liabilities and credits when the soundness of their balance sheets becomes critical.

Considering the factors above, even SME suppliers in supply chains and independent SMEs could face SME finance issues. In this respect, the research project by WAIFC in 2022 offers a pertinent starting point for this research project on Supply Chain Finance.

All in all, this white paper discusses supply chain finance as a practical case of SME finance in a changing economic environment. It examines its challenges and unique features in reference to promoting the Green Transformation, with a view to making a new contribution to the previous WAIFC research project.

Chart 1: SCF as practical case of SME finance



SME finance plays many roles for various countries and has different relevance according to the industrial/financial structures of respective jurisdictions.

The basic purpose of SME finance is to provide the funds necessary for sustainable business operations within SMEs. SMEs represent the majority of the economy in terms of the number of employees and offices and, therefore, have a strong impact on social welfare. The significance of empowering SMEs through finance for stable macroeconomic and national economic utility hardly needs to be stressed.

Nevertheless, there is a diversity of opinions about the purpose of SME finance at a higher level.

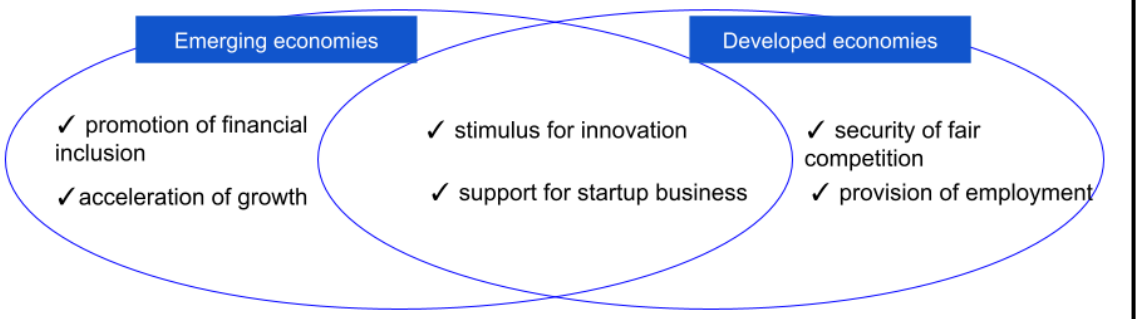
One example is financial inclusion, which aims to provide indispensable financial services at a reasonable cost for SMEs and universal economic agents. In this case, the key is to prevent the unreasonably high costs of informal financial services from destabilizing economies and to deter the growth of illegal financial means.

From a more positive viewpoint, SME finance can accelerate the modernization of an industry structure. By supporting SMEs' capital investment from the financial side, it can gradually shift domestic production activities to those with higher added value.

Similarly, SME finance fosters startups. By providing financial support for SMEs with novel business models and cutting-edge technologies, SME finance can stimulate the whole economy and reinforce industries' international competitiveness.

The priority of these various purposes of SME finance differs according to the financial and economic structures of their respective economies.

Chart 2 : Various purposes of SME finance



In contrast, a “one-size-fits-all” approach no longer applies. One example could be attributing the purpose of SME finance in developing countries to improving financial inclusion and then to raising innovative companies when it comes to developed countries. On the contrary, rapidly growing economies also benefit from the growth of innovative startups, and developed countries face new challenges of financial inclusion due to tightened financial regulations.

The experience of Casablanca

SMEs represent an important part of the Moroccan economy in terms of the number of companies, number of jobs created, tax revenues generated, percentage of GDP, dynamism, and innovation. However, local SMEs are facing multiple challenges: access to financing, access to the market, international expansion, and attracting, retaining, and reskilling talent. The objective of SME finance is to scale up financing to companies as well as de-risking investment while solving some bottlenecks, including the lack of appetite from banks and investors for the risk profile, relatively high cost of financing, lack of data and scoring, and the lack of guarantees. Overall, the goal is to put in place a conducive environment for SMEs to thrive.

The most common policy instruments are government loan guarantees, special loan guarantees for start-ups, direct lending to SMEs, dedicated SME banks, and subsidized interest rates. Several incentives and relief programs have been put in place, for instance, during the COVID-19 pandemic (moratorium on repayment of

loans and credits, direct subsidies, bespoke credit lines, and guarantees). It is worth noting that innovative alternative financial instruments for SMEs are being designed by market participants through crowdfunding platforms and Islamic finance vehicles to finance working capital.

However, supply chain finance for SMEs faces several challenges in Morocco and in Africa, broadly speaking:

- Cross border bottlenecks;
- Lack of common accounting and legal standards and guidance;
- Limited risk appetite of some protagonists in supply chain finance (some countries/industries/SMEs are misperceived and considered as risky);
- Cost considerations, especially for SMEs;
- Data sharing, collection, and transparency along the value chain;
- Overall fragmentation of the supply chain value chain;
- Compliance hindrances (onboarding of suppliers, some purchase-based techniques are cumbersome);
- Keeping up with the fast pace of the technological revolution.

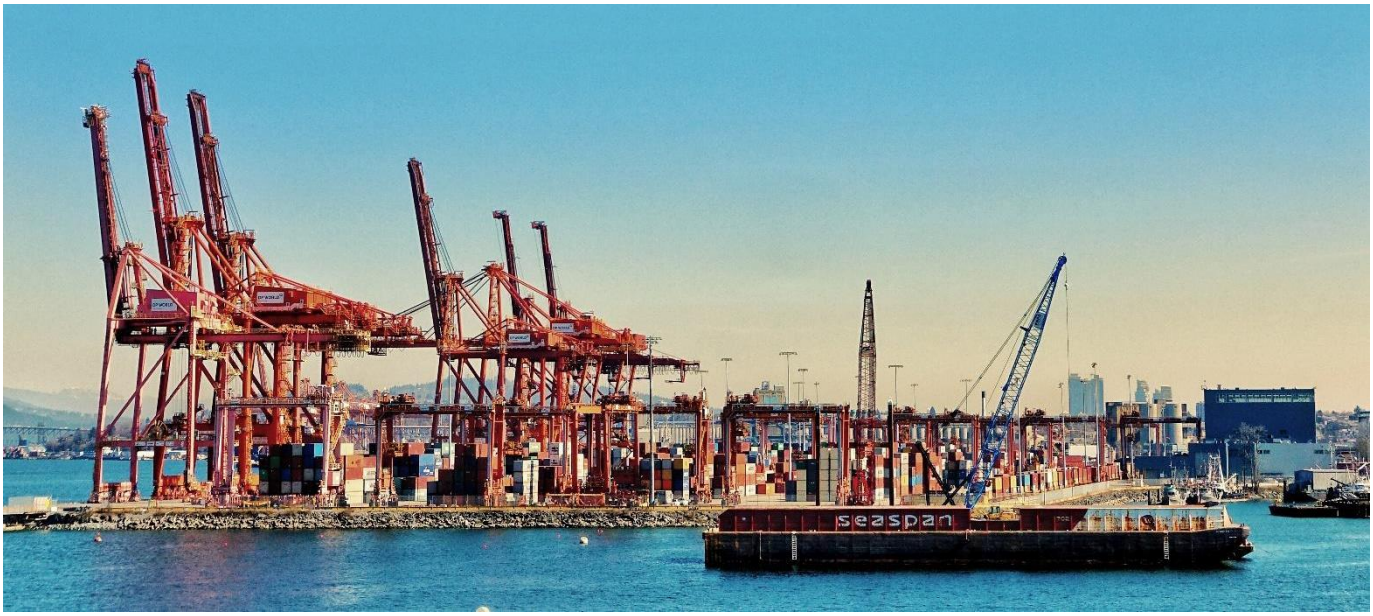
Startups and tech companies on the continent are starting to develop solutions to address such pain points, using open data platforms, distributed ledger technologies such as blockchain for tracking and authentication, artificial intelligence, and innovative crowdsourcing.

By increasing visibility within supply chains, the sharing of costs and risks in the green transformation could be improved through:

- Better traceability;
- Reduced information asymmetry;
- Enhanced risk management across the value chains;
- Cost reduction;
- Overall competitiveness and efficiency.

The experience of Rwanda

Similarly to Casablanca, SMEs play a crucial role in Rwanda's economy (SMEs comprise 97% in numbers and contribute 55% of its GDP. As Rwanda aspires to become an upper-middle income country by 2050, as indicated in its national strategy "Vision 2050," the importance of promoting SMEs as a major driver of



economic growth cannot be overstated.

Despite governmental measures to support them, SMEs in Rwanda also face several challenges in the field of supply chain finance, including:

- High collateral and documentation requirements
- Unsuitable financial products
- Risk aversion from financial institutions
- Lengthy procedures

Credit risk coverage is the primary constraint institutions are facing in increasing their lending to SMEs. The National Bank of Rwanda requires all banks and Monetary Financial Institutions (MFIs) to cover credit risk with 150% collateral.

As the financial measures to support SMEs, which are expected to play a key role in fostering economic inclusion and tackling the issue of youth unemployment, several products are available, such as:

- Guarantee funds like the Business Development Fund (BDF)
    - BDF offers individual guarantees covering 50% to 70% of the loan amount to entrepreneurs with little or no collateral in order for entrepreneurs to obtain credits from financial institutions
- Particularly looking at SCFs, the Development Bank of Rwanda ("BRD") and the German Kreditanstalt für Wiederaufbau (KfW) named the "Export Growth Fund" (EGF), which is designed to facilitate SMEs' access to finance for export-related activities through subsidized loans, grants, and guarantees.

SCF as a financial solution for SMEs

Enhancing SCF is a universal solution that serves diverse countries in achieving the respective goals of SME finance.

Despite the diverse purposes of SME finance, the enhancement of Supply Chain Finance (SCF) and its utilization will be a valuable solution for achieving many of these goals.

The provision of funds for SMEs through enhanced SCF is obviously beneficial. It contributes to stabilizing economic and social welfare by enhancing the sustainability of SMEs' businesses. It also contributes to improving social conditions at large by reducing dependence on informal finance.

As we will discuss in the following chapters, SCF (as defined in this white paper) not only provides funds for the operation of supply chains but also supports a wider set of financial services. These include reallocating risks that pertain to supply chain management and providing risk capital for restructuring supply chains. Obviously, these functions play a role in promoting structural reforms within the SMEs' business areas and in creating new business models with novel technologies.

Regardless of the focus of SME finance, the enhancement of SCF is expected to show its effectiveness and offer universally workable solutions. From different viewpoints, in order to realize the fully-fledged functions of SCF, efforts must go beyond smooth fund provision and focus on risk redistribution.

Enhancing SCF also contributes to improving financial functions, which is mandatory for international financial centers.

During the discussion, WAIFC members have not identified concrete examples of SCF that could contribute to enhancing the functioning of international financial centers, at least so far.

Nevertheless, as the WAIFC 2022 research project implied, many of the members are already conscious, explicitly or implicitly, of the importance of SME finance and are engaging with public and private practitioners to strengthen it in one way or another. As already discussed, a number of SCF issues overlap with SME finance. In this respect, many WAIFC members have already been undertaking initiatives relating to SCF.

The experience of Malta

The Maltese government signed an agreement with the EIB Group to enhance the financing available under the SME Initiative in Malta. The SME Initiative involves leveraging European Structural and Investment Funds, the Horizon 2020 program, and funds from the EIB Group in tandem.

Through the SME Initiative in Malta, the Bank of Valletta and BNF Bank have allocated a target portfolio of nearly EUR90 million for new SME financing in the form of loans across the country. Due to the successful uptake of this initial agreement, additional resources have been allocated for this initiative, resulting in an additional EUR28 million in SME financing under advantageous terms, such as reduced interest rates and improved collateral requirements, thereby increasing the target portfolio.

The objective of injecting additional finance is to bolster job creation and foster economic growth. SME financing serves as a bridge, addressing the disparity between the liquidity accessible from banks and the actual access to that liquidity through guarantees.

By the end of 2023, it is anticipated that this initiative will have supported over 1000 SMEs, resulting in a total loan volume of approximately EUR118 million.

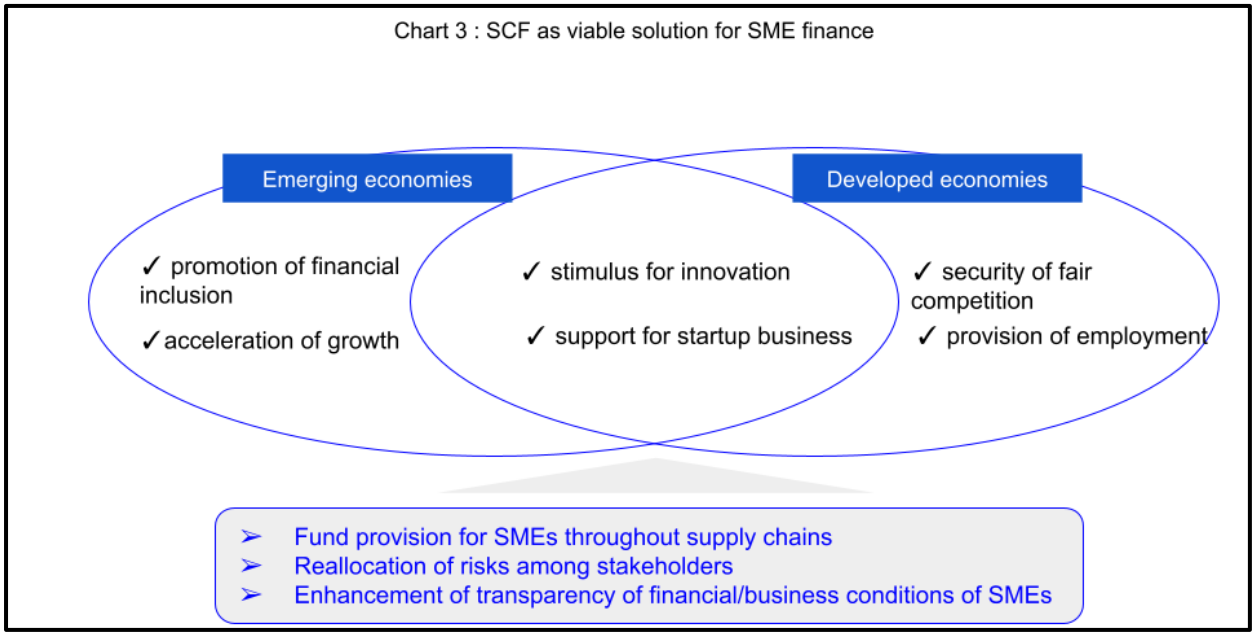
As revisited in the next chapter, visualizing and enhancing supply chains has become an internationally important policy issue regardless of economic size or political stance. More and more firms ask for support from financial institutions as they deal with supply chain issues.

Under these circumstances, timely discussion of SCF as a specific agenda item by neutral organizations such as WAIFC members has a remarkable significance in gaining support for their activities from international financial centers.

From a more practical point of view, proposals, and actions to strengthen SCF by respective members of WAIFC can meaningfully contribute to conquering more serious issues being faced by respective financial systems.

As discussed more concretely in the following chapters, one example of enhanced SCF is the exercise of financial services according to the value of goods and services in supply chains, as well as the related infrastructures (asset-backed finance). In order for these services to function properly, we need the disclosure

Chart 3 : SCF as viable solution for SME finance



of information about and knowledge to evaluate the resale values of such assets and the markets for trading them.

These initiatives pave the way towards achieving a broader policy goal of enhancing investment value chains (which comprises (1) striking the right balance between banks and capital markets in financial intermediation

and (2) empowering the flow of investment funds for businesses). This is because SCF for the Green Transformation facilitates what is commonly called "market-based indirect finance" and creates a new business model with the assistance of the asset evaluation functions of leasing companies and trading firms.

For banks, the enhancement of corporate disclosure can potentially accelerate the trend of expanding credit based on the evaluation of movable properties, including intangible assets such as technologies and business models. Such developments, encompassing climate change adaptation, can undoubtedly contribute to the deeper engagement of banks with their corporate clients.

Efforts by respective WAIFC members to enhance SCF through policy measures will empower the financial functions necessary to fulfill the role of an international financial center.

REINFORCING SUPPLY CHAINS THROUGH FINANCE

In this chapter, we will examine how finance can help to address the issues of supply chains, which have evolved with the globalization of the world economy but are now facing new challenges in changing economic environments.

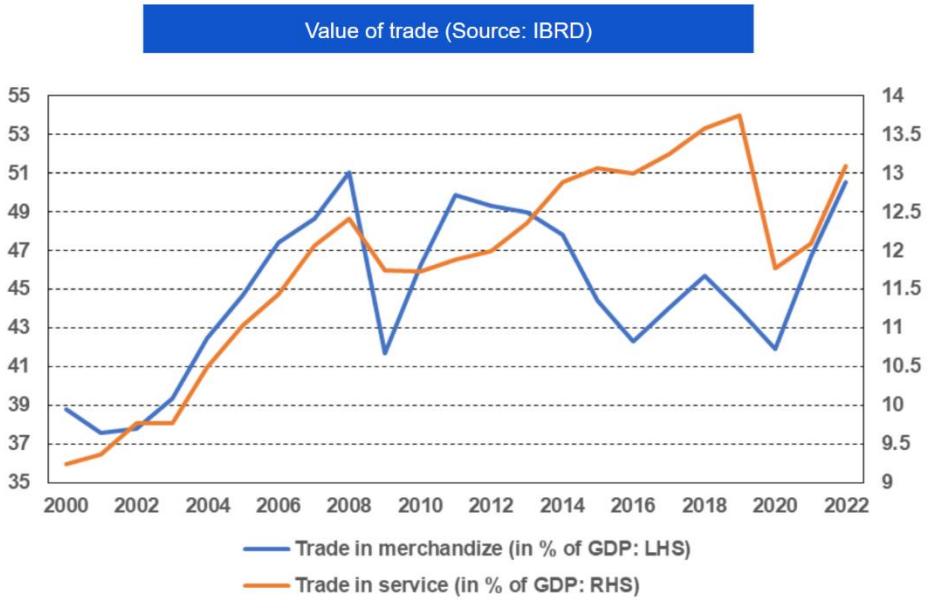
Significance of reinforcing supply chains

As each country pursued efficiency in economic activities, supply chains have evolved with globalization and become densely intertwined.

The most important feature of the world economy in the early years of the 21st century is the globalization of economic activities. This trend created common markets in various areas, supported by deregulation policies of many emerging countries in terms of the flow of goods, services, and capital.

Globalization had various benefits: cross-border demands skyrocketed, and economic stability improved through the extensive division of labor in the production and logistics processes. Consequently, globalization effectively stimulated the economic growth of emerging economies and increased their employment and income, improving their economic welfare.

Chart 4: Global trend of common market



Globalization also benefited developed countries. The shift to economic activities with higher added value made their industry structures more sophisticated and their production activities more efficient. As a result,

globalization underpinned economic growth for developed countries, and their economic welfare improved through more convenient consumption. What is more, both developed and developing countries enjoyed the fruits of enhanced innovation, which is a key by-product.

The emergence and expansion of global supply chains were at the center of globalization. This was made possible by compressed costs, improved efficiency of telecommunication and transportation in supply chains, and deregulation by relevant parties.

Since the beginning of this century, globalization has been characterized by the development of dense supply chains in Asia, involving a sophisticated division of labor, which established it as the "world's factory."

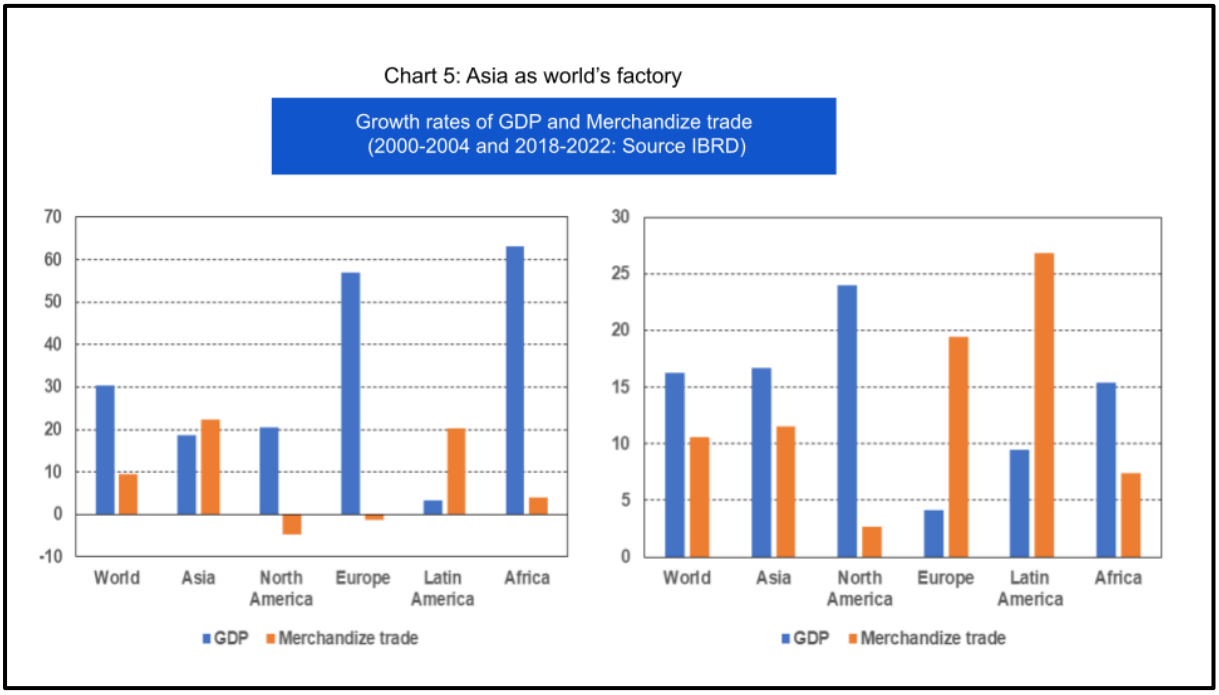
Such supply chains were previously characterized by a vertical division of labor. Raw materials produced in developing economies were processed and transported through multiple stages to eventually be sold as final products in developed economies. However, in recent years, due to the economic growth and innovation in emerging nations, there has been a noticeable evolution of horizontal specialization, where both emerging and advanced economies engage in processing items with advanced technologies.

Simultaneously, the scope of supply chains has expanded beyond goods to include services. Enterprises in developed economies have already become heavily reliant on emerging economies for a range of services, from computer software development and administrative tasks related to accounting and law to customer service functions. These developments also indicate the evolution of supply chains in the context of the division of labor between emerging and advanced economies.

Advanced supply chains experienced some disruption due to natural disasters. Notable examples are the great earthquake in Japan in 2011 and the global pandemic that began in 2020.

In the former case, the supply of electronic parts halted, leading to significant disruptions in global automobile manufacturing. In the latter case, particularly due to infection control measures in Asian countries, the assembly of essential materials and electronic parts for the production of various goods was disrupted, resulting in prolonged worldwide supply constraints.

Chart 5: Asia as world's factory



These phenomena apparently indicated that supply chains are already integral parts of the economic activities of both developing and developed economies.

Chart 6: Disruption of supply chains due to the pandemic

Amid intensifying East-West confrontation, supply chains have become a focal point of policy measures for the security of strategic materials and the maintenance of industries' competitiveness.

As the geopolitical tensions worsen, economic globalization faces new challenges. Such tensions include:

- Escalation of US-China tensions, which were already apparent before the pandemic.
- The war in Ukraine led to unstable supplies and soaring prices of energy, food, raw materials, and medical supplies.
- The economic and financial sanctions by Western countries against Russia have accelerated fragmentation in the global economy.

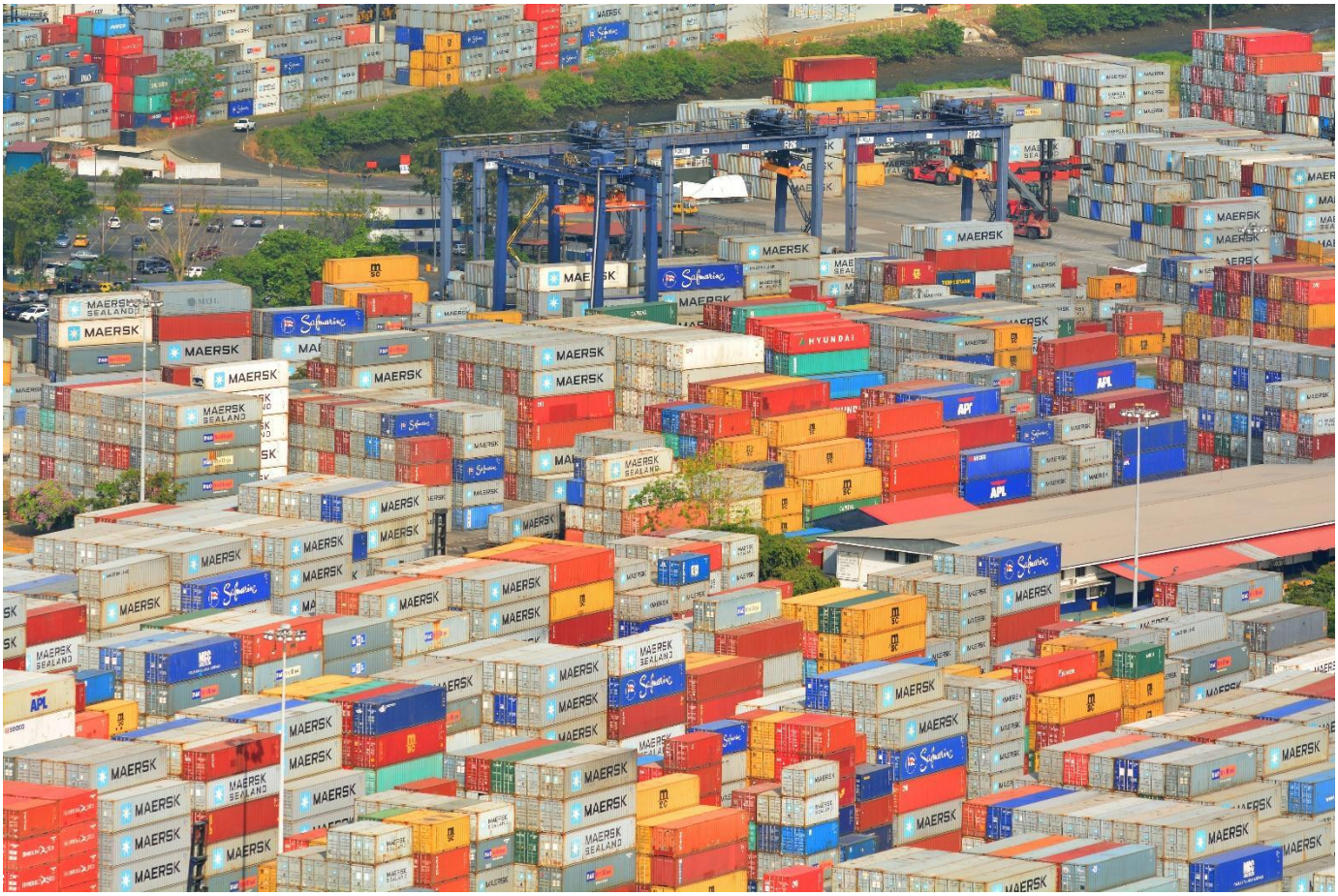
Most recently, both emerging and developed economies are actively exploring and promoting measures to enhance supply chains to secure critical resources and reinforce the competitiveness of strategic industries in a new economic environment. These efforts appear to re-establish a framework for sustainable utilization of the benefits of the sophisticated division of labor that have been enjoyed thus far.

Specific examples of such policy measures include:

- Restructuring the division of labor in supply chains among politically allied countries ("Friend-shoring") by establishing and expanding trade agreements.
- Incentivizing private enterprises to shift significant production and development processes to their own countries with a view to securing critical resources and reinforcing industrial competitiveness.

These developments suggest that the phase in which globalization was driven solely by economic rationality has come to an end. However, it is important to note that economies are not aiming for complete self-sufficiency. Rather, the emphasis lies on adapting and reconstructing supply chains in response to changing circumstances. As each economy tries to adapt to the new environment, it is uncertain, at least for now, whether the momentum of globalization has diminished.

In any case, the significance of supply chains is increasingly recognized both by emerging and developed economies, making their empowerment a crucial policy agenda.



Contribution of finance towards reinforcing supply chains

Finance provides funds necessary for investment and innovation, both of which are crucial for reinforcing supply chains, along with reallocating risks involved in supply chains to wider stakeholders.

Despite various situations across the economies, efforts to enhance supply chains (as well as industrial chains, as we have discussed) require investment by both the private and public sectors.

For example, in order to restructure the existing division of labor at a production or development level, new facilities for such activities may need to be established. In order to enhance resilience and visibility of the flow of goods and services through supply chains, online platforms are necessary to collect data efficiently. Furthermore, in order to contain costs amid global inflation and a high-interest rate environment, further improvements in logistics and telecommunications are required.

The need for upfront investment in these endeavors is evident. Given that supply chains are composed not only of large firms but also many small and micro enterprises, the importance of providing suitable financial services, as indicated by the findings of research projects on SME finance, cannot be overstated.

Support or provision of finance by the public sector is a valuable solution in cases where SMEs' access to finance from banks or capital markets is limited due to financial and human resource constraints. Furthermore, as efforts to strengthen supply chains have externalities in the sense that their outcomes spread widely to broader stakeholders, public sector involvement holds significance from the perspective of addressing "market failures." In fact, it would take a longer period of time for the investing entities to realize tangible results.

The significance of finance aimed at enhancing supply chains goes beyond just facilitating the supply of funds; it also involves redistributing risks borne by private firms to a broader set of stakeholders.

For private firms working to enhance supply chains, large-scale investments in various areas are required. For SMEs, the burden of risks accompanying investments over the medium to long term poses a significant challenge. For large firms, too, venturing into new domains poses great challenges, given the uncertainty accompanying innovation. This document focuses especially on the climate transition, where not all the

necessary technological solutions are provided.

Imposing the risk burden only on firms implementing capital investments destabilizes their financial conditions and harms the incentives for such investments, which could severely hinder the enhancement of supply chains. Since eliminating such risks altogether is almost impossible, a framework where a wider set of stakeholders share the risks is necessary.

The public sector can establish such a framework by providing guarantees or insurance. It can also facilitate it by utilizing finance from the private sector. This is because the essence of finance lies in allocating risks along with funds.

In order to realize such favorable outcomes, as discussed in later chapters, it is also necessary to establish frameworks for disclosing accurate and timely information about risks, as well as mechanisms for pricing risks properly based on relevant information.

The experience of Frankfurt

Germany aims to ensure that the German SME sector remains the driving force behind dynamic economic development in the future. Germany believes more young companies are needed alongside established ones to open up new markets and create sustainable jobs through innovation and investment. Access to suitable financing is a key prerequisite for this.

The Federal Government, therefore, supports small and medium-sized enterprises (SMEs), freelancers, those interested in founding a company, and innovative start-ups with a wide range of financial support programs so that they can realize new projects, products, processes, and services. In particular, a range of funding instruments have been set up for start-up, succession, growth, and innovation financing.

The programs aim to create reliable support for German SMEs and to create an economically favorable environment in which the innovation potential and inventiveness of SMEs can flourish.

The programs provide low-interest loans, equity capital, or grants for start-up projects, business consulting, or growth investments. The aim is to support company founders in all phases—from spin-offs from universities and research institutions to the expansion and growth of young companies on the market. Good access to venture capital is a key success factor, especially for start-ups and young technology companies.

The experience of Rwanda

Rwanda hosts a continental export development fund, the Fund for Export Development in Africa (FEDA). Headquartered in Kigali, this is a subsidiary of the African Export-Import Bank (Afreximbank). It just started operations this year and has the ambition to provide equity capital and related support to operators in Africa's tradable and support sectors, with emphasis on activities that support intra-African trade and value-added exports.

Since 2023, FEDA has been the fund manager of the $1 billion African Continental Free Trade Area (AfCFTA) Adjustment Fund, with Afrexim Bank already committing $350 million. The Fund will invest across all market segments but will have its greatest focus on small and medium-sized enterprises. They offer equity-like instruments tailored to finance businesses and all stages of development, from startup to mature enterprises, and they make investments in critical sectors such as telecommunication, energy, agro-processing, and refactoring industrial parks.

FEDA is considered a game-changer in the supply chain financing landscape as it seeks to promote industrialization and drive intra-African trade. It was established to tackle Africa's $110 billion financing gap for intra-African trade, value-added export development, and industrialization value chains.

Finance integrates the associated flow of money and information with the flow of goods and services, enhancing the efficiency of supply chains.

In financial services, the adaptation of digital technologies is advancing rapidly. Especially in the area of transactions, digital information has come to be proactively utilized to oversee the flow of goods and services

efficiently. As a result, financial services are being offered at competitive costs in such areas as payment, cash management, and extension of credit. In these cases, the unique nature of digital technology is effectively used. It has the ability to process and analyze the data flow of funds, goods, and services in an integrated manner.

Innovations related to public clouds and Decentralized Finance (also known as DeFi, referring to an emerging area within financial technology that uses distributed ledgers or blockchains to provide financial services) have also significantly reduced the costs associated with the construction and operation of these platforms.

Chart 7: Costs of transaction

Analysis by the Financial Stability Board (2021)

	Wholesale	Retail (e.g. B2B, P2B/ B2P, other P2P)	Remittances
Current costs	Individual costs vary per bank e.g. due to volume, value discounts or time-based charges (to incentivise early settlement).	For card issuers, up to 10% depending on the card issuer/ merchant fee and FX margin (excluding taxes).[13]	Global Average 6.38% ($200 payment) (Q1 2021).[14]
Current speed	FX transactions may be same-day where RTGS hours overlap, or may be T+2 settlement in other cases. 48 hours or longer (traditional correspondent banking).	As an example, 92% of payments that use SWIFT gpi MT103 primarily B2B payments are processed in less than one business day (i.e. not including bank holidays or weekends).[16] Normally card payments take 2-5 business days to clear through an automated clearing house.	By current services offered (out of 5000 serving 367 corridors, representing 85% of remittance flows globally): 53% is <1 hour 65% is <same day 76% is <next day 84% is <2 days

Indeed, the fact that such platforms are developing not only in advanced economies but also in emerging economies indicates the great potential for a wide range of WAIFC members to benefit from such features. New types of finance that utilize digital technologies can be expected to contribute to the enhancement of supply chains in various ways. Firstly, the efficient collection of data covering the flow of goods and services using digital technology leads to greater transparency in supply chains. This visibility is a crucial element for the Green Transformation, particularly in the context of this document. Furthermore, the efficient monitoring of the value of goods and services provides substantial support to the activities of firms comprising supply chains by enabling financial services at competitive costs. In addition, sophisticated payments lead to the reduction of associated costs among broader firms involved in supply chains and also expedite decision-making, thereby

enhancing the competitiveness of the supply chain.

Considering the "network externality" involved in payments, from a long-term perspective, the stimulated competition among these supply chains can also lead to improved interoperability through the benefits of standardization inherent in digital information. If this happens, firms could enjoy the advantage of curbing

redundant investments, and the macroeconomy could benefit from enhanced efficiencies in production and distribution.

The experience of Nigeria

Like in many other developing economies, the roles of micro, small, and medium-scale enterprises (MSMEs) in Nigeria are central to the productive sector and the empowerment of a teeming lower-income population. The focus on MSME or SME finance comes under job creation priorities in the national development plans. For the National Development Plan 2021-2025, Nigeria aims to create 21 million jobs, and this will be achieved partly through access to finance for entrepreneurs, which are broadly in the category of MSMEs. To drive this goal, access to finance would be facilitated by the development and specialized banks, including the Development Bank of Nigeria and the Bank of Industry.

In addition, according to the Small, Medium Enterprise Development Agency of Nigeria (SMEDAN)'s National Policy 2021-2025 on MSMEs, there are two objectives for MSMEs' finance, namely:

- To effectively address the challenges of financial access to create, operate, and/or expand viable MSMEs in Nigeria
- To reduce and ultimately close the funding gap to MSMEs

To achieve these objectives, some of the key strategies of the agency include plans to harmonize all MSME finance intervention schemes; increased access to loans through the Development Bank of Nigeria; create a

single platform on information about funding to MSMEs; create MSME Development Fund to reduce the level of bureaucracy involved with access to finance; provide inclusion programs for MSMEs with a priority for the informal sector; support the implementation of the Finance Act targeting tax incentives for MSMEs; institutionalize non-interest finance products for ethics-inclined entrepreneurs; activate and implement the SME Credit Guarantee Scheme and interest draw back schemes; broaden access to finance through specialized MSMEs banks, microfinance institutions, development institutions, capital markets, venture capital firms and equipment leasing firms; encourage collective self-help mutual funds/crowd funding, encourage financial institutions to support disadvantaged groups, women and youth with specialized financial products.

The Small, Medium Enterprise Development Agency of Nigeria (SMEDAN) recognized inadequate finance as a key challenge for the growth of MSMEs in Nigeria. According to the International Finance Corporation, the existing funding gap is $32.2 billion.

There are many challenges along the value chain in areas such as haulage, transportation, and storage. It is difficult and expensive to move goods from the point of production to consumer destinations/markets because of poor road infrastructure and transport systems. In addition to the transportation challenges, storage facilities are inaccessible for many reasons, including the lack of a constant power supply. Lack of cold chain supply logistics is also a fundamental problem, leading to extensive loss of perishable goods from farm to market. These challenges culminate in a long supply chain with many intermediaries, leading to high prices of goods and services at the final destination.

These are some areas where risk capital for green transformation will be required: to provide low-carbon emission transport systems, such as rail transit, cold chain logistics, and renewable energy supply for constant power to storage facilities.

Nigeria is committed to sustainable development and climate change adaptation and is one of the nations that have assented to the Nationally Determined Contributions. In line with this commitment, the government has enacted a Climate Change Act and equally set up a National Council on Climate Change to support the implementation of a National Climate Change Action Plan.

While the plan is still in the works, some achievements have been recorded across various sectors of the economy. For example, in the transportation sector, governments and the corporate sector are providing support for improved access to safe, affordable, and sustainable transport systems through the Rail Transport System. Recently, the federal government launched Compressed Natural Gas-powered buses. Lagos State Government has developed an electric-powered (blue) rail transportation project and Quality Bus Corridors that are contributing to a reduction in carbon emissions in the city. The reactivation of the interstate rail transportation systems is also helping to improve the country's supply chain challenges.

Overreliance on climate-sensitive, agriculture-based livelihoods has always been a risk factor in the Sahel and has led to massive deforestation. Under the national afforestation program, the federal government of Nigeria has forested 6,191,363 hectares of land through sovereign green bonds.

The government has also invested in renewable energy projects, including micro-utilities in rural communities and the Katsina wind farm. The wind farm has 37 functioning turbines with a generating capacity of about 275kW of power. Also in the power sector, in December 2023, the World Bank approved the Nigeria Distributed Access through Renewable Energy Scale-up (DARES) project, which is financed by an International Development Association (IDA) credit of $750 million and will leverage over $1 billion of private capital and significant parallel financing from development partners, to ensure deployment of standalone solar and mini-grids and replace more than 280,000 polluting and expensive petrol and diesel generator sets. It will also enhance the ongoing World Bank-financed Nigeria Electrification Project (NEP), which has supported the establishment of 125 mini-grids and the sale of over a million Solar Home Systems.

In the corporate sector, Access Bank concluded a climate adaptation project. The flood defense project spans 8 km of Victoria Island shoreline. Also, there was Access Bank's solar photovoltaic generation project with an estimated capacity of 35,718.02 MWh per year covering South-East (Enugu), South-West (Lagos), South-South (Port Harcourt), and the Federal Capital Territory (Abuja). Other climate transition activities include the provision of finances by financial institutions to fund renewal energy, such as a clean energy loan by First City Monument Bank (FCMB) to support households and small businesses and credit by Bank of Industry (BOI) provided to support renewable energy players.

FOCUS ON GREEN TRANSFORMATION IN SCF

In this chapter, we examine the significance of Green Transformation, which is gaining attention as efforts are being made to empower supply chains both in developed and developing economies. Then, we confirm that SCF can play an outstanding role in promoting smooth, sustainable, and balanced actions for the Green Transformation.

Reasons for the significance of Green Transformation as a common challenge

This is a solution to the shared global challenge of climate change, which requires globally-concerted efforts.

The research project at WAIFC in 2023 picked up on Green Transformation through supply chains, with a view to their enhancement in various aspects. The primary reason for this focus is that climate transition has become a common and essential policy agenda for many WAIFC members.

"Physical risks," such as extreme weather events resulting in large-scale floods, forest fires, high tides, and the spread of regional infections, are already manifesting globally, regardless of whether an economy is developed or emerging. Preventing climate change becomes an urgent task to achieve the overarching goals of economic policies, including sustainable growth and prosperity.

However, the economic stagnation due to the pandemic and subsequent uncertainties about the supply of energy and food has hindered global policy momentum against climate change. This leads to the risk of postponing the proper responses. Under these circumstances, conflicts over the allocation of responsibilities between emerging and developed economies become severe.

Global collaboration is indispensable for addressing climate change. The primary reason is that climate change phenomena are interconnected and correlated globally. Measures by respective economies have spill-over effects for other economies globally. Under such "externalities," there is a risk that economies might be incentivized to enjoy a free ride on the efforts of others, potentially leading to insufficient responses globally.

In reality, various international organizations and policy forums, regardless of public or private sector affiliation, are requesting all economies to address climate change under globally harmonized frameworks. Many economies agree with such ideas and conduct measures from medium to long-term viewpoints.

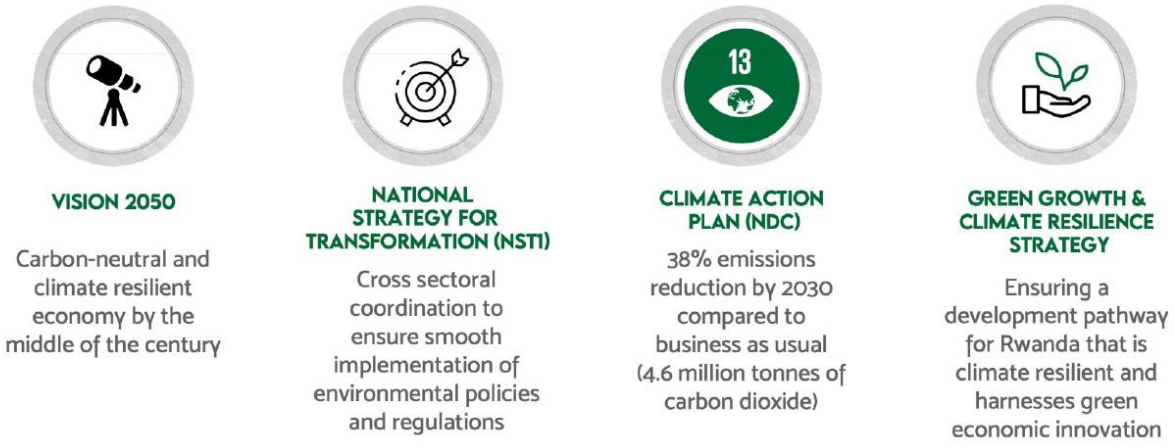
The experience of Malta

During the last quarter of 2023, a draft National Energy and Climate Plan covering the period up to 2030 has been launched. While this plan and other related strategies, such as the Malta Low Carbon Development Strategy (LCDS), focus on industry, they do not delve deep into the supply chain level.

Based on our findings from the financial services industry, supply chain finance is still in its early stages of development. Consequently, the allocation of risk capital is not currently a primary concern. This is primarily attributed to a scarcity of data and information available in this domain. The financial services sector holds a privileged position to gather and scrutinize data pertinent to supply chains, primarily due to its potential vulnerability to adverse effects when exposed to high-risk organizations that aren't adequately addressed through risk management protocols.

The experience of Rwanda

Rwanda has taken a strategic decision to pursue a green growth approach to development and has charted a pathway that is climate resilient and harnesses green economic innovation. To achieve this objective, Rwanda has adopted a number of overarching policies which highlight the country's objectives and ambitions:



Based on the understanding that the public sector alone cannot mobilize all this financing and achieve this vision of making Rwanda developed and resilient to climate variability and change, Rwanda stresses that the private sector, especially SMEs, has a crucial role to play and embarks at full speed on this journey.

Currently, the private sector ecosystem is burgeoning with the following initiatives that can be mentioned:

- The launch of the Rwanda Sustainable Finance Roadmap, which serves as a blueprint on how the Kigali International Financial Centre aims to "greenify" the Rwandan ecosystem;
- The Rwanda Stock Exchange, which is in the process of establishing a Green Finance Window to foster the issuance of green, sustainable, sustainability-linked and social bonds;
- The mainstreaming of environmental, social, and corporate governance (ESG) standards across financial institutions;
- The pro-green fiscal incentives introduced (e.g., Hybrid and e-vehicle tax exemptions) and a progressive tax policy.

Furthermore, from the point of view to increase the uptake of Rwandan SMEs to embrace sustainable practices and enable the acceleration of "green" oriented SMEs, the Development Bank of Rwanda ('BRD') and the Rwanda Green Fund have joined forces to create the "Ireme Invest" program. This initiative is unique in many ways and is a home-grown solution to enable the creation of more green SMEs. The program has two main windows. There is the "Project Preparation Facility" window, which offers grants and equity investments, as well as the "Credit Facility" window, which provides concessional financing and guarantees across a wide range of sectors respectively: clean energy, smart mobility, sustainable cities, climate-smart agriculture and waster and circular economy. In terms of activities taking place in the capital market, it is important to note the launch in 2023 of the first Sustainability-Linked Bond ('SLB') issued by the Development Bank of Rwanda, which is the first issuance of this kind of instrument by a national development bank in East Africa and even globally. It was a total success, as it was oversubscribed, drawing demand from 100+ different investors. Thanks to the credit enhancement facility provided by the World Bank, the institution raised three times the amount of funding from capital markets. This serves as an important signal for other potential issuers and contributes to building capacity in the domestic capital market. The SLB comes to raise funds to support the bank's ambition to mainstream environmental, social, and governance for partner financial institutions, increase women-led business loans, and finance affordable housing in Rwanda.

Our research project has an advantage under the framework of coordination among international financial centers by WAIFC.

WAIFC is composed of representatives from major international financial centers worldwide. These centers exchange insights and information on various themes to carry out the necessary responses to play their expected roles both internationally and domestically.

Each member of WAIFC shares such knowledge and information with domestic stakeholders in their respective economies. Through broad engagement with both the public and private sectors, they promote and propose appropriate responses smoothly and in a timely manner.

These themes are highly relevant to the policy challenges that many WAIFC members commonly face despite their different perspectives. The theme for 2023, the enhancement of the Supply Chain for the promotion of the Green Transformation, shares such features as demonstrated in chart 3. Similarly, as mentioned at the beginning of this document, the current theme also holds significance as a practical "applied problem" following the previous year's focus on SME finance.

Moreover, WAIFC's engagement with the theme of supply chain enhancement from a green transformation perspective has much potential significance as WAIFC members maintain contact with domestic stakeholders in both the public and private sectors. Their role in collaboration and cooperation is crucial because, as we have identified, the strengthening of supply chains requires a division of labor between the public and private sectors. This is valuable from the viewpoint of promoting the Green Transformation.

The experience of Dubai

Dubai and the UAE are actively implementing climate transition strategies across various industries to address environmental challenges and promote sustainability. These efforts are being pursued at both the governmental and private sector levels. Here are some ways in which Dubai and the UAE are implementing climate transition strategies:

- Through renewable energy investments

The UAE has made significant investments in renewable energy projects, particularly solar and wind power. The Mohammed bin Rashid Al Maktoum Solar Park in Dubai is one of the world's largest solar parks and aims to generate 5,000 megawatts of clean energy by 2030. Dubai has set ambitious targets to increase the share of clean energy in its energy mix, aiming for 75% by 2050.

- Green Building Initiatives

Dubai has introduced green building regulations and initiatives to promote sustainable construction practices. The Emirates Green Building Council (EmiratesGBC) works to advance green building principles and practices across the UAE. The UAE has implemented programs such as Estidama in Abu Dhabi and Al Sa'fat in Dubai, which focus on enhancing energy efficiency and sustainability in building design and construction.

- Carbon Capture and Storage (CCS)

The UAE is exploring carbon capture and storage technologies to mitigate greenhouse gas emissions from industries such as oil and gas. Projects like the Al Reyadah CCS facility in Abu Dhabi capture CO2 emissions from industrial sources and inject them into underground reservoirs for storage.

- Sustainable Transportation

Dubai is investing in sustainable transportation infrastructure, including electric vehicle (EV) charging stations, public transportation systems like the Dubai Metro, and initiatives to promote cycling and walking. The UAE is also exploring the use of hydrogen fuel cells and biofuels for transportation to reduce reliance on fossil fuels.

- Circular Economy Initiatives

Dubai and the UAE are promoting circular economy principles to minimize waste generation and maximize resource efficiency. This includes initiatives to encourage recycling, waste-to-energy projects, and the development of sustainable packaging solutions.

Regarding implementation at the supply-chain level, while Dubai and the UAE have made significant strides in implementing climate transition strategies within industries, there is increasing recognition of the importance of addressing sustainability throughout the entire supply chain. Many companies in the UAE are adopting sustainable procurement practices, working with suppliers to reduce carbon emissions, minimize waste, and ensure ethical sourcing.

Launched in 2019 by DIFC and DFM, the Dubai Sustainable Finance Working Group (DSFWG) aims to coordinate efforts towards integrating environmental, social, and governance best practices across Dubai. The DSFWG continues to be chaired by DIFC and its 40+ active members and ten sub-working groups and has established itself as a key translator and change agent between the high-level groups in the UAE and globally that focus on policy and ambitions and the private and public sector entities to help them move to action and

make the change happen. Initially mainly engaging the finance sector, the reach of the working group increased over the years to all sectors of the economy. The DSFWG enables its corporate members to share best practices related to responsible business operations, including supply chain sustainability - embedding ESG into business operations to mitigate risk and achieve best governance and reporting practices.

However, there is still room for further integration of sustainability considerations into supply chain management practices, and efforts are ongoing to encourage greater transparency, accountability, and collaboration among stakeholders across the supply chain.

- Supplier Sustainability Requirements

Government entities and large corporations in Dubai and the UAE are increasingly incorporating sustainability criteria into their procurement processes. This includes requiring suppliers to adhere to environmental standards, reduce carbon emissions, and demonstrate sustainable practices throughout their operations. For example, government tenders may include sustainability requirements such as energy efficiency, use of renewable materials, and adherence to waste reduction targets.

- Green Certification Programs

Dubai and the UAE have established green certification programs for products and services to incentivize sustainable practices within supply chains. Suppliers may be required to obtain certifications such as Leadership in Energy and Environmental Design (LEED) or Green Building Certification to qualify for government contracts or partnerships with sustainability-focused companies. These certifications demonstrate a commitment to environmental responsibility and help businesses differentiate themselves in the market.

- Collaborative Initiatives and Partnerships

Public-private partnerships and collaborative initiatives play a crucial role in promoting sustainability across supply chains. Dubai and the UAE host forums, workshops, and industry associations where stakeholders can share best practices, collaborate on sustainability projects, and address common challenges. For instance, the UAE Food Bank collaborates with food retailers, manufacturers, and logistics companies to reduce food waste and redistribute surplus food to those in need.

- Supply Chain Traceability and Transparency

Increasingly, companies in Dubai and the UAE are investing in technologies and systems to enhance supply chain traceability and transparency. This allows them to monitor and track the environmental impact of their supply chains, identify areas for improvement, and make data-driven decisions to optimize resource usage and reduce emissions. Blockchain technology, for example, is being explored to provide transparent and immutable records of sustainability metrics such as carbon footprint, water usage, and ethical sourcing practices.

- Capacity Building and Education

Dubai and the UAE are investing in capacity building and education programs to raise awareness and build skills related to sustainability within supply chains. This includes training workshops, seminars, and certification programs designed to equip suppliers and stakeholders with the knowledge and tools needed to integrate sustainability into their operations. The DIFC Sustainable Finance Catalyst will offer training programs on sustainability reporting, GHG accounting, and decarbonization for businesses and professionals involved in supply chain management.

Reasons for the importance of the transition strategy and the way SCF Green Transformation contributes

The transition strategy has proven effective in many of the economies where WAIFC members are domiciled.

In addressing climate challenges on a global scale, it is standard practice to distinguish economic activities across broad business sectors that contribute to climate transition efforts from those that do not. The former can then be supported through measures such as funding, taxation, and regulation. Such a categorization, known as a "taxonomy," is adopted by public entities, industry groups, and others. The results of its application

are published in manners tailored to their respective perspectives and policies.

The idea of this approach is transparent and straightforward, effectively guiding the allocation of economic resources, including funds, towards investment and consumption that is in harmony with the prevention of

climate change. For firms, adhering to the "taxonomy" for activities including investment, production, and distribution offers the advantage of raising sufficient funds at low cost from banks and capital markets.

However, preventing climate change by ways of halving or ceasing greenhouse gas (GHG) emissions requires considerable structural modification of production, distribution, and consumption. In order to achieve these goals in a rational manner, substantial funds need to be invested over a long period.

Furthermore, when looking from a longer perspective (20 to 30 years), there is considerable uncertainty associated with innovation and policy responses. Consequently, the "taxonomy" needs to evolve over time. Activities initially recognized as beneficial for climate transition according to the current "taxonomy" could potentially lose their relevance in later years.

Here, we identify the rationality in "transition" strategies that incorporate the time-horizontal aspects of paths toward net-zero goals and allow flexibility against uncertainties in responses to climate change. Moreover, these strategies are not exclusive to "taxonomy"-based approaches. By incorporating flexibility in the application of the "taxonomy," the taxonomy approach converges with the "transition" strategy.

Many of the economies where WAIFC members are domiciled are characterized by industries with high GHG emissions, particularly mining and manufacturing. Given the need to transform production and transportation processes over time with substantial amounts of investment, "transition" strategies are highly relevant to these economies.

In order to ensure that "transition" strategies don't simply delay climate change adaptation, public entities, and industry groups are required to create roadmaps for economic transformation with scientific and rational structures. Major industries and firms' engagement with these roadmaps could enhance the transparency of progress toward the policy goal.

The experience of Frankfurt

Germany has implemented multiple laws to help implement a climate transition strategy. The Erneuerbare-Energien-Gesetz (the German Renewable Energy Sources Act) regulates the feed-in of electricity from renewable sources into the local operator's electricity grid and the remuneration of the electricity fed in. The law aims to promote "green electricity" and increase its share of total electricity generation. By 2025, 40 to 45 percent of electricity in Germany is to come from renewable sources. By 2035, the share is to rise to 55 to 60 percent. Other laws address energy efficiency and sustainable heating in buildings (GEG) as well as digitalization of the energy transition (GDEW).

Starting in 2024, Germany implemented a new law aiming to make supply chains more sustainable. The law strengthens human rights and environmental protection in global supply chains. It obliges companies in Germany to respect human rights by implementing defined due diligence obligations. These obligations apply to their own business operations, to the actions of a contractual partner, and to the actions of other (indirect) suppliers. This means that companies' responsibility no longer ends at their own factory gates but extends along the entire supply chain.

Companies must first identify, assess, and prioritize the risks in their supply chains. Based on the results, a policy statement is published, and measures are taken to prevent or minimize human rights violations and damage to the environment. The law sets out which preventive and remedial measures are necessary. Other obligations include the establishment of complaints channels for people in the supply chains and regular reporting on supply chain management.

SCF can make contributions in various aspects, including reallocation of capital and risks.

For the purpose of addressing climate change effectively and sustainably on a global scale, it is essential to achieve appropriate burden-sharing of costs and risks according to the economic and technological capacities of both emerging and developed economies. Such practices should address conflicts of interest among them. Similarly, within the structure of supply chains, there is a need for appropriate distribution of roles among buyers and the various layers of suppliers.

However, emerging economies or lower-tier suppliers located in these countries allegedly bear an excessive burden of the costs and risks involved in climate change adaptation. From the perspective of developed economies or buyers, this is the phenomenon of "Greenwashing," where climate change adaptation efforts might be superficial and lack practical implementation. In this regard, actions to prevent climate change are required not only from the viewpoint of compliance with regulations but also of promoting appropriate actions against climate change.

Cases of Greenwashing often originate from differences in bargaining power in buyer-supplier relationships or from differences in regulations or demands regarding climate change adaptation between emerging and developed economies.

While altering these root causes might be difficult, enhancing the transparency of supply chains could contribute to alleviating the problem. In other words, if each economy within the supply chain visualizes its greenhouse gas emissions and the measures to offset them, it reduces the incentives for Greenwashing.

Considering the above, a mechanism is necessary to share the funding required for investments and allocate risks associated with innovation. It could encourage firms within supply chains to undertake climate transition action commensurate with their economic and technological capabilities. Such a mechanism should involve a wide range of stakeholders, including banks and capital markets.

As confirmed in previous chapters, SCF can enhance supply chains. Moreover, the utilization of digital technologies offers the important advantage of efficiently collecting and analyzing transaction-related information. Relevant information is obtained through the visualization of supply chains, which contributes to the proper implementation of efforts against climate change.

In the international community, there is growing attention paid not only to addressing climate change but also to responding to broader ESG concerns, including protecting workers' rights, preventing child labor, and

maintaining biodiversity. Simultaneously, both emerging and developed economies face challenges for sophisticated industrial structures to recover from the pandemic's effects on economic growth.

At least in terms of economic activities, the transparency of supply chains and the redistribution of costs and risks among stakeholders can contribute to achieving various policy objectives. In this sense, the idea and practice of enhancing supply chains through SCF from the perspective of the Green Transformation can be applicable to different policy issues.

The experience of Nigeria

Supply chain financing accelerates trade by providing payment settlement options that allow buyers and suppliers to meet their obligations. Below are some institutions supporting supply chain financing:

- Development institutions such as the Central Bank of Nigeria (CBN), the Development Bank of Nigeria (DBN), and the Bank of Industry (BOI) play a significant role in providing financial support and interventions to improve supply chain finance. They often collaborate with other stakeholders to create platforms or initiatives aimed at enhancing access to finance for businesses along the supply chain. These platforms include financing schemes, credit facilities, or grants targeted at specific sectors or industries.
- Agritech platforms in Nigeria focus on leveraging technology to address challenges in the agricultural supply chain. These platforms often provide services such as market linkage, digital payment solutions, and access to finance for farmers and other actors within the agricultural value chain. By facilitating transactions and streamlining processes, agritech platforms aim to improve efficiency, reduce costs, and enhance access to finance for agricultural businesses. ThriveAgric, for example, is a platform that leverages technology solutions to offer input financing and post-harvest services, strengthening the value chain and increasing outputs for smallholder farmers. The company disburses loans in the forms of farm inputs, such as improved seeds, farm tools, etc., processes and documents farm produce for storage, and monitors inventory activities post-harvest.
- Banks and Payment Systems Operators. Payment systems operators in Nigeria, including fintech companies and traditional financial institutions, play a crucial role in facilitating supply chain finance through digital payment solutions. These operators offer platforms and services that enable businesses to make and receive payments seamlessly along the supply chain. Additionally, some payment systems operators provide working capital financing, invoice discounting, or other financial products tailored to the needs of businesses engaged in supply chain activities. As part of the effort to support SMEs journey, Wema Bank (a commercial bank) offers MSME payment and receipt solutions: customers are able to pay for services, and at the same time, merchants can optimize salary, initiate invoicing, and carry out other support services like access to FX transactions and cash flow analyses. Onafriq, formerly MFS Africa, Flutterwave, Interswitch, and Carbon, equally provide payment and receipt solutions. Meanwhile, many other commercial banks, including First Bank, Zenith Bank, United Bank for Africa, Fidelity Bank, First Monument Bank, Access Bank, Guaranty Trust Bank, and Union Bank in Nigeria, offer SME product finance options like import finance, invoice discounting finance, secured term loans, office equipment finance.
- Fintech companies in Nigeria are at the forefront of innovation in supply chain finance, offering digital solutions to optimize financial processes and improve access to credit. These companies provide platforms for supply chain financing, invoice factoring, inventory management, and trade finance. By leveraging technology such as blockchain, artificial intelligence, and data analytics, fintech companies aim to enhance transparency, reduce risks, and unlock capital for businesses operating within supply chains. Kuda Bank is a digital bank in Nigeria that offers financial services to individuals and businesses. Its platform provides digital banking solutions, including account management, payments, and lending, supporting supply chain finance for businesses across various sectors. Lidya is a fintech company that offers digital lending and financial management solutions to small and medium-sized enterprises (SMEs) in Nigeria. Its platform provides working capital loans, invoice financing, and other financial products tailored to the needs of businesses involved in supply chain activities.
- Trade associations and industry groups in Nigeria, like the Manufacturers Association of Nigeria (MAN)

and the Nigerian Association of Chambers of Commerce, Industry, Mines and Agriculture (NACCIMA), often collaborate with stakeholders to develop platforms or initiatives aimed at addressing challenges in supply chain finance within specific sectors. These organizations provide networking opportunities, advocacy, and access to financing resources for their members. By fostering collaboration and knowledge sharing, trade associations contribute to the development of innovative solutions to enhance supply chain finance within their respective industries.

ROLE OF FINANCE IN ENHANCING SUPPLY CHAINS FOR GREEN TRANSFORMATION

In this chapter, building on the discussions in the previous chapter, we analyze the funding features required for enhancing supply chains to promote the Green Transformation. We will also examine how burdens should be shared between the public and private sectors in providing funds.

Features of capital needs

In order to promote the Green Transformation, both capital investment and innovation are required.

A starting point for firms to reduce the GHG emissions entailed in economic activities (such as production and logistics) is to review the management of machines and equipment employed in supply chains. For example, measures are actually taken, such as reducing operating time and switching energy sources to reusable ones.

However, for both emerging and advanced economies, achieving the goal of reducing GHG emissions to virtually zero in the long run is not possible only with these gradual "improvements." This is evident when considering the roadmap set for key industries according to "transition" strategies.

In other words, firms engaged in economic activities are required to transform their production and transportation methods to align with climate transition goals, though not immediately. For that purpose, investments are necessary not only for machinery and equipment but also for systems controlling them.

As seen in the previous chapter, advancing the Green Transformation throughout supply chains necessitates capital investments, even for both small and micro-sized companies, albeit with varying scales and scopes. Here, the challenges specific to SME finance arise.

As long as supply chains function as inter-firm networks for transactions, capital investment for the purpose of Green Transformation is not merely confined to changing machinery and equipment within each company. For instance, building and improving networks and platforms for efficiently digitizing and analyzing information related to GHG emissions also forms part of the necessary capital investments for the Green Transformation through supply chains.

Furthermore, as the "transition" strategy clearly suggests, there are a number of industries for which net zero goals would be practically impossible to meet, relying solely on technologies and equipment already in use. This is especially the case with “hard-to-abate” industries. It implies the need for a long-term (20 to 30 years) outlook on innovation so that new technologies for production and transportation can be developed further to reduce GHG emissions or to enhance the effective absorption of GHGs.

While some of these innovations are already in experimental stages and close to practical implementation, considerable uncertainty remains surrounding the overall technological possibilities. In other words, over the long-term time horizon, uncertainties in policy responses and potential halts in support for certain innovations are to be expected.

Managing the risks of policy outlook and technology is necessary.

The provision of risk capital is fundamentally crucial in the financial aspect of achieving green transformation through enhancing supply chains.

The experience of Casablanca

Morocco released its Long-Term Low Emission Strategy during COP28. The strategy aims to reach carbon neutrality by 2050 and builds on several sectorial masterplans crafted by the public authorities and private sector. It encompasses various verticals such as energy, agriculture, transportation, infrastructure, and industry. The objective of the strategy is to reduce GHG emissions, protect the environment and biodiversity, foster energy efficiency and the use of renewable energy, better manage natural resources (for example, water) and waste, and promote sustainable and inclusive development for local communities and territories (including, for instance, rural areas, women, youth, elderly, and the bottom of the pyramid).

These orientations are driving industrial policies. For example, there is a strong push for electrification, energy efficiency, and the use of energy from renewable sources (PV, CSP, offshore, hydroelectric). To cite a figure here, Morocco’s objective is to reach 52% renewables in the national energy mix by 2030.

The Moroccan authorities are also considering establishing a carbon market (including, for instance, pricing mechanisms, exchange of quotas and carbon credits, and taxes on emissions) to reduce carbon emissions in the most polluting sectors gradually.

Initiatives exist to provide risk capital for the green transformation, including seed capital, grants, business angels, and venture capital financing. However, these remain relatively limited in scope and scale. For instance, certain types of companies/industries/geographies tend to be underserved or not served at all.

There is a strong push from the Moroccan authorities to foster supply chain finance digital transformation as well as sustainability. Key policy measures have been implemented, including for instance:

- A public authority, the Agency in charge of the Development of the Digital (A.D.D.), has been set up to develop the e-economy and promote the digital transformation agenda in Morocco;
- Dedicated capacity-building & training initiatives are conducted by the private sector and the public authorities;
- General awareness and advocacy efforts.

On the private sector side, leading Moroccan banks are conducting initiatives to promote the Green Transformation in supply chains. Overall, it is still too early a stage to judge the overall efficiency of such measures.

By Philippe Roos is licensed under CC BY-SA 2.0

In other words, sustained and long-term efforts by respective firms are essential for mitigating climate-related risks. They need to make continuous improvements to machinery and equipment. These investments entail a degree of risk since their funding amounts correspond to the revenues associated with production and transportation over multiple years.

For small and micro-sized companies comprising supply chains, the funds for investments carry even higher risks due to their constraints in access to finances, lack of expertise, and insufficient transparency of business.

For large enterprises alike, especially those in industries with considerable GHG emissions, it is necessary to drive innovations in production and transportation. Given the inherent uncertainties accompanying these endeavors, the funding required is anticipated to carry substantial risk. This factor can also be affected by the aforementioned uncertainties in policy responses.

Looking from a longer-term perspective, startup firms with innovative technologies and business models, in addition to large enterprises, are expected to play a key role. They are expected to provide solutions to issues such as the development of advanced technologies for climate transition and the utilization of analysis tools of digital information. Startup firms have already gained prominence in areas such as renewable energy, including solar and wind power, and absorption of GHGs, not only in advanced economies but also in emerging ones.

Nevertheless, funding these startup firms to drive innovation requires “risk capital” in the strict sense of the term, and the constraints arising from SME finance due to resource limitations within companies are at their most binding here.

Burden-sharing between public and private sectors in providing capital

Chart 9: Policy options for reallocation of risks (2)

Between private and public sectors

Instrument	Function	References
Trade insurance	Government provides insurance for transactions through supply chains	・Public insurance for international trade
Credit guarantee	Government or their funds provide guarantee for transactions through supply chains	・Public guarantee on bank lending
Government sponsored loans	Government sponsored financial institutions extends credits with special terms to firms in supply chains	・Special loan program
Government sponsored funds	Government sponsored funds invest in firms in supply chains with special terms	・Special investment program

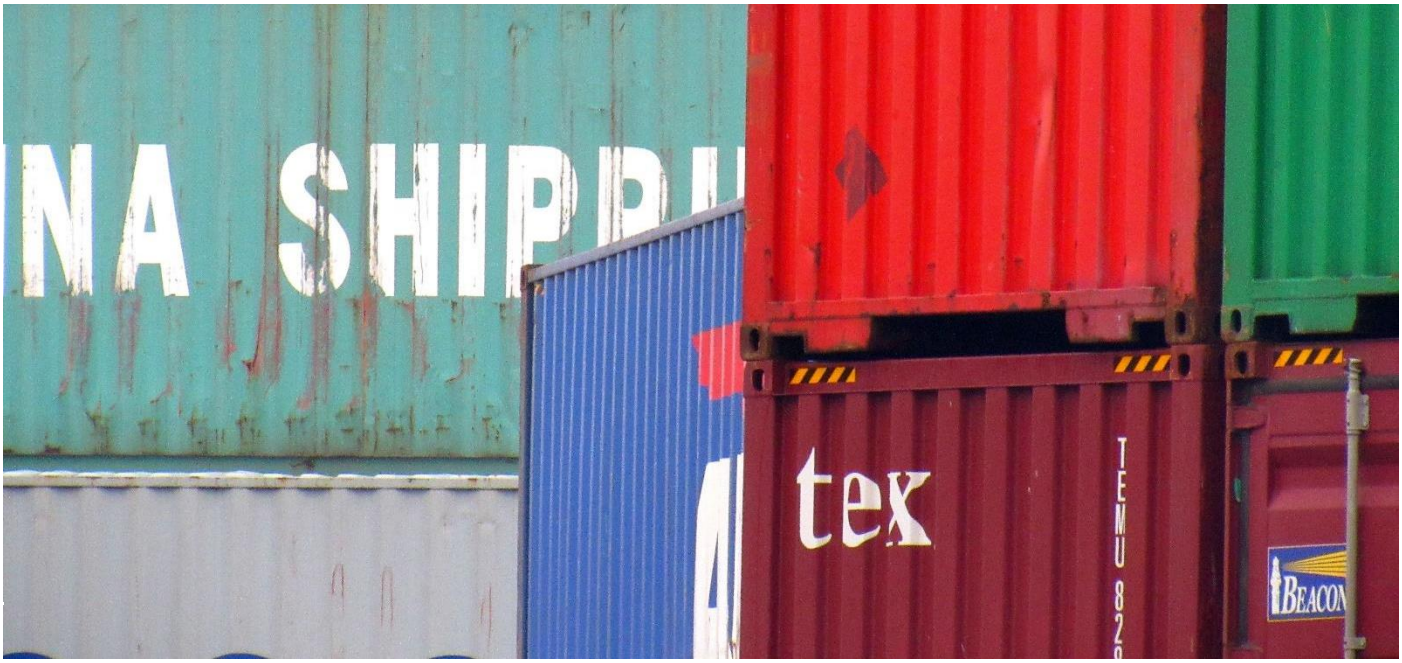
Capital investment should be designed to encourage the crowd-in effect to mobilize a large amount of private capital.

International and private organizations estimate that a significant amount of investment is needed over the next 20 to 30 years in fixed capital and R&D activities to achieve the net-zero goal and the necessary transition in economic activities. Many governments of WAIFC member economies have similar outlooks.

The actual amount of investment necessary for the Green Transformation can fluctuate according to the scale of innovation as we go along, and the innovations that actually affect SCF are only one part of it. Nonetheless, the estimated amounts necessary for SCF Green Transformation go well beyond an ordinary scale of capital investment for firms. This is the reason why designing a framework for the provision of capital is a key issue.

Moreover, the public sector cannot be fully relied upon to provide the capital necessary for Green Transformation. Many developed and developing economies are facing deteriorating fiscal conditions after long years of low growth and the global pandemic. Nevertheless, the private sector cannot fully absorb the risks, either.

As far as the risk capital that is necessary to trigger a Green Transformation, it is important to acknowledge



first of all that all of such funds would deal with various uncertainties. This would be a tough task for SMEs.

If firms were to raise all the funds through equity, the cost of funding could increase, potentially disrupting their financial soundness. Alternatively, it would be a better option to raise the necessary funds with equity in proportion to the risks and raise the residual funds with debt instruments. Furthermore, debt can be structured in layers based on the seniority of repayment.

In this context, while the public sector plays a significant role in supplying the equity portion, it is appropriate for the private sector to be the primary provider of the debt portion. As a result, the public sector's propensity to take risks acts as a "catalyst," encouraging private sector funding with the "crowding-in" effect.

The fiscal burden on the public sector would be possible to contain, as the necessary portion of equity funding would be relatively small. The private sector is realistically positioned to deal with substantial funding needs. This idea of division of roles, which has already been implemented as part of industrial policy in many economies, has good prospects for effectiveness.

Ensuring the efficient supply of funds for the Green Transformation through a balanced public-private collaboration is crucial for reinforcing the momentum of climate change adaptation.

However, in the long term, it is desirable to shift the role of supplying equity more towards the private sector, not only for its sustainability but also for the enhancement of market mechanisms.

Specific choices vary depending on the financial and economic structure of each country.

There are various options available for the public sector when it takes on the role of supplying the equity portion for supply chains from the perspective of the Green Transformation.

The simplest option is for the government to invest directly in firms. In such cases, it could make investments through government-affiliated financial institutions or funds. These financial institutions and funds may have different mandates, including SME finance, support for startup firms, or specific goals like climate change adaptation and supply chain enhancement.

The primary goal of risk sharing is also achievable through options other than direct risk capital provision. One practical example is the provision of credit guarantees by the public sector covering the debt supplied by the private sector. Alternatively, the public sector could offer investment insurance for firm managers or private investors.

The practical hurdles for applying these methods to the Green Transformation appear to be relatively low, considering that many governments among the WAIFC members are already practicing in areas like industrial policy and SME finance.

Moreover, the public sector in these economies already plays a pivotal role in enhancing financial intermediation for the smooth supply of the debt portion by the private sector.

For instance, if the private sector is to supply debt based on varying repayment seniority, introducing structured finance, including debt securitization, is relevant. The establishment of legal and regulatory frameworks and addressing aspects of accountancy for this purpose falls within the realm of the public sector's role.

Introduce mechanisms and instruments of asset-based financing based on the value of goods, services, and associated machinery for SMEs that constitute supply chains. These could contribute to securing the debt component, even under the constraints of borrowers in terms of their access to finance and lack of personnel and transaction relationships. Establishing such a framework also plays a crucial role in the public sector.

Members of WAIFC should clarify their priorities within these various options and promote their realization through collaboration with stakeholders in their respective economies. The options will naturally vary depending on each economy's financial and economic structures.

The public sector might effectively utilize guarantees or insurance for bank lending, where financial intermediation through banks holds significant weight. Alternatively, in countries with well-developed capital markets, there could be value in government-private partnerships for funds or structured finance, for example. Moreover, it might be a good option to adopt a strategy of dealing with the weakness of financial functions as a policy priority for the Green Transformation.

The experience of Dubai

The provision of risk capital is critically important for facilitating the green transformation of supply chains in the UAE and Dubai. Risk capital, which includes investments such as venture capital, private equity, and public funding, plays a crucial role in funding innovative and sustainable solutions, particularly in industries where the transition to green practices may require significant upfront investment or involve higher levels of uncertainty.

- Funding Innovation: Risk capital enables companies to invest in research, development, and deployment of innovative technologies and practices aimed at greening their supply chains. This could include investments in renewable energy technologies, sustainable agriculture practices, waste reduction solutions, and circular economy initiatives.
- Scaling Green Solutions: Many green technologies and practices may be at an early stage of development or require scaling up to achieve commercial viability. Risk capital provides the necessary funding to scale these solutions and integrate them into supply chains on a broader scale.
- Addressing Market Gaps: Risk capital is essential for filling market gaps where traditional financing options may be unavailable or insufficient. This is particularly relevant for startups and small to medium-sized enterprises (SMEs) that are driving innovation in green technologies and may face challenges in accessing conventional financing.
- Navigating Regulatory Uncertainty: In industries where regulations related to environmental sustainability are evolving, risk capital can help companies navigate regulatory uncertainty and adapt to changing requirements by funding compliance initiatives and sustainability measures.
- Promoting Collaboration and Partnerships: Risk capital can facilitate collaboration and partnerships between different stakeholders in the supply chain, including suppliers, manufacturers, distributors, and investors. This collaboration is essential for implementing holistic and impactful green transformation initiatives.
- Industries with High Environmental Footprints: Industries with significant environmental footprints, such as energy, transportation, manufacturing, and agriculture, often require substantial investments to transition to more sustainable practices. Risk capital is particularly necessary in these industries to support the adoption of green technologies and processes.

Specific industries where the provision of risk capital is most necessary for the green transformation of supply chains in the UAE and Dubai include:

- Renewable Energy: Investments in solar and other renewable energy projects.

- Transportation: Funding for electric vehicles, public transportation systems, and infrastructure for sustainable mobility.
- Waste Management: Investments in recycling facilities, waste-to-energy projects, and circular economy initiatives.
- Water Management: Funding for water conservation technologies, desalination innovations, and sustainable irrigation practices.
- Construction and Built Environment: Investments in green building technologies, energy-efficient construction materials, and sustainable urban development projects.

ADVANTAGES OF SCF GREEN TRANSFORMATION FOR STAKEHOLDERS

In this chapter, we discuss how SCF for the Green Transformation provides benefits for firms as the primary drivers of the Green Transformation and providers of financial services as accelerators of the Green Transformation.

Advantages for firms to promote Green Transformation

SCF contributes to the efficient provision of SME finance.

Firms, as the primary drivers of the Green Transformation, can benefit in various ways from enhanced finance functions that cover supply chains. The primary benefit is improved access to funds. Firms could raise funds efficiently from banks and capital markets through effective corporate disclosures that indicate corporate Green Transformation actions, such as investments, to banks and investors.

Moreover, firms could benefit from reduced funding costs. If they properly share the social values of the Green Transformation, the costs of funding from banks and capital markets could be lower than otherwise. This is sometimes called the “Green Premium.”

Examples of the Green Premium

Risk factors constitute part of the costs of funds. As seen above, firms can distribute the risks of Green Transformation-related actions through finance. Reallocating the risks is an effective source of cost reduction for firms.

Factors	Mechanism
Appetite of investors	Excess demands by investors for green assets raise the valuations
Assessment by rating agencies	Higher evaluations on green assets by rating agencies raise the valuations
Regulations by financial authorities	Regulations on financial services for green assets by relevant authorities raise the valuations
Reputations by general public	Public reputation for financial activities of green assets raise the valuations

These advantages are all the more relevant to SMEs, as is obvious from the discussion above. SMEs play a large part in supply chains, but their access to finance and sharing of costs is hampered by various factors peculiar to SMEs. Furthermore, the burden of risks borne by SMEs is a substantial impediment to SMEs’ Green Transformation-related actions.

Meanwhile, the benefits to large firms are expected to be small. In fact, while large corporations are essential for the Green Transformation, they can relatively easily procure large amounts of funds from banks and capital markets as operating capital. Moreover, higher-tier suppliers within supply chains can provide funds through

intercompany credits like "parent-subsidiary loans."

However, it is still important for large firms to show that a certain amount of their funding is intended for Green Transformation-related practices. This practice could provide "Green Premium," as reviewed above. Furthermore, the facilitation of the Green Transformation through SCF for a wide range of SMEs within supply chains holds indirect but significant importance, given the growing requirement for Green Transformation in every business activity.

SCF encourages business investment and innovation by a broad range of firms.

SCF for Green Transformation contributes to the advancement of Green Transformation for a broad spectrum of companies, including SMEs that form supply chains, by improving their access to funding, reducing their costs, and enabling risk-sharing.

Of particular importance is the contribution to facilitating business investment and innovation for the firms driving Green Transformation. As seen earlier, the implementation of a Green Transformation requires extensive restructurings in production and transportation, necessitating continuous updates to production facilities and machinery for both large firms and SMEs within supply chains. Moreover, especially for hard-to-abate industries, developing new technologies for production and transportation will be crucial.

Through appropriate SCF schemes, we could stimulate capital investment and innovation by introducing risk-sharing between the firms driving Green Transformation and a wide range of stakeholders, such as banks, capital markets, and governments.

Benefits for financial service providers that support Green Transformation

SCF for Green Transformation promotes engagement and efficient risk management by banks.

Banks are expected to play a significant role in providing Supply Chain Finance (SCF) to firms that drive Green Transformation initiatives. Their role would be particularly significant for Small and Medium-sized Enterprises (SMEs). In return, providing SCF for Green Transformation offers various benefits for banks.

Firstly, SCF enhances engagement with companies that borrow funds from banks. Banks have the accumulated expertise to understand and share insights into borrowers' business plans and their implementation. Based on such resources, they could offer appropriate advice and support as needed. Given that Green Transformation-related practices have now become central to corporate management, the importance of banks' engagement toward Green Transformation has significantly increased.

Therefore, banks' provision of SCF for Green Transformation contributes to promoting engagement as it improves their understanding of borrowers' business plans and enables effective advice and support in corporate management.

Secondly, SCF improves the efficiency of their risk management. When banks support borrowers' Green Transformation-related practices through loans and other financial services, banks' exposure to climate change risks increases. This issue is known as "Financed Emissions." This is an inevitable issue when the transition approach is adopted to implement climate actions.

However, from the business side, capital investment and relevant funding are essential to implementing a Green Transformation. Moreover, banks' increased risk exposure is evidence that risks are appropriately shared between firms and banks.

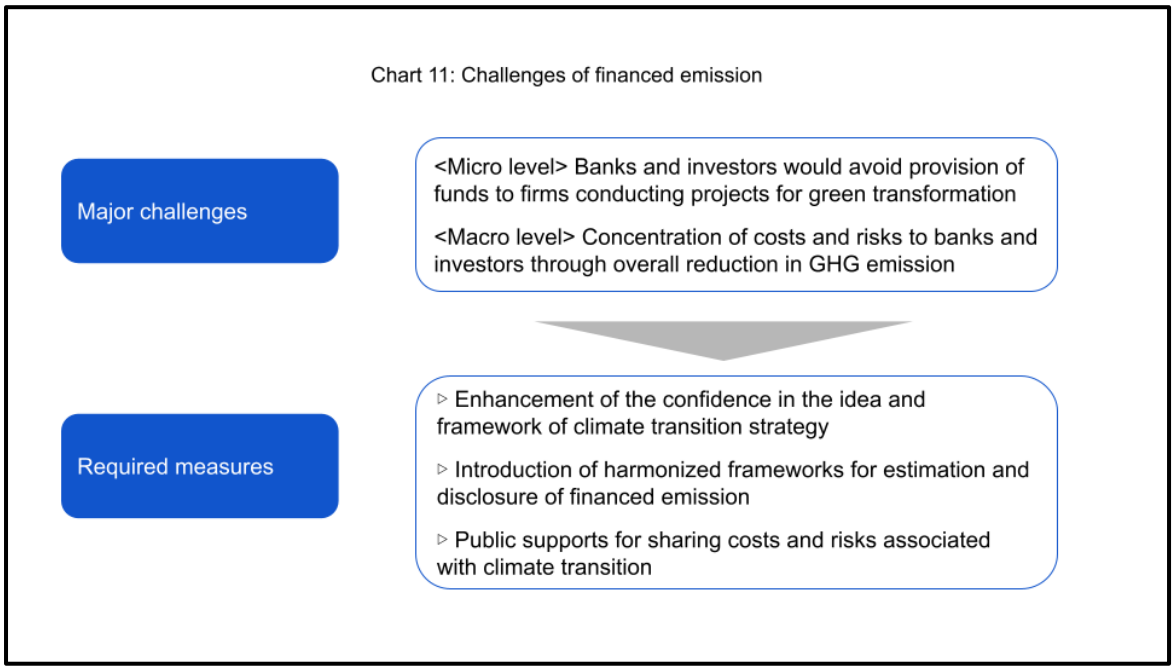
From the viewpoint of banks, it is important to share the understanding that risk burdens emerge from reasonable and policy-oriented Green Transformation practices by customers and that they will gradually diminish over time. Such proper knowledge contributes to managing the risks of "Financed Emissions" efficiently. This knowledge also needs to be shared with investors and policy authorities. It is meaningful for banks, by providing SCF, to stay in a position to grasp the whole situation of the Green Transformation in supply chains and wield influence on them in order to achieve the shared understanding above.

SCF Green Transformation contributes to allocating risk capital through capital markets and deters Greenwashing.

The role of capital markets in providing SCF to firms is crucial, as large firms play a dominant role in the

implementation of the Green Transformation in terms of quantity. From the perspective of capital markets, providing SCF for Green Transformation offers various benefits.

Chart 11: Challenges of financed emission



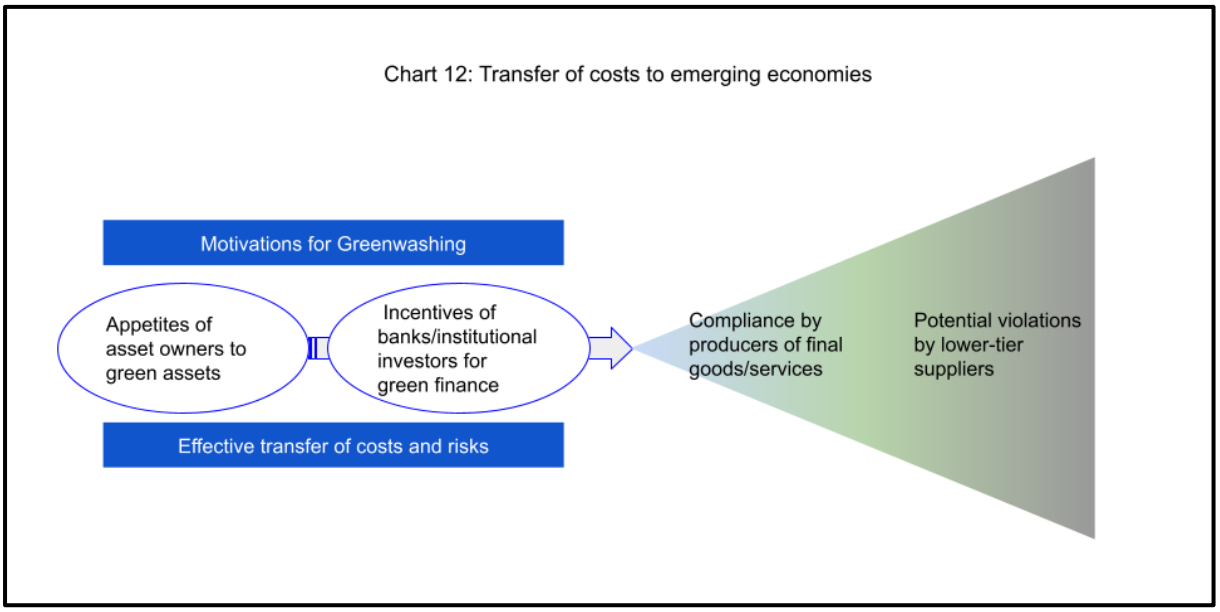
The primary role of capital markets is channeling risk capital to firms. As we have seen, investment and innovation are indispensable for firms, especially large corporations at the core of supply chains, to implement the Green Transformation. These activities come with various uncertainties, making the procurement of risk capital crucial.

Large firms, however, often possess relatively solid financial foundations and ample available funds. Moreover, funding all investments and innovations with risk capital is not always cost-effective due to their higher costs to raise. Moreover, risk tolerance also varies among the respective investors supplying funds through capital markets.

As a result, for firms, especially large ones, an effective implementation of the Green Transformation lies in an appropriate combination of various means of risk-sharing with investors. It means making use of an appropriate "finance mix" of risk-sharing.

Such approaches fit well with the features of capital markets, which include markets of structured finance or asset-based finance. In other words, capital markets can provide a more appropriate "finance mix" for implementing the Green Transformation, especially by large firms.

SCF, through capital markets, helps to curb “Green Washing.” Conceptually, it is a situation where firms improperly benefit from the "green premium" in fundraising despite advancing an “inappropriate” form of Green



Transformation. However, the substance of the Green Transformation and the "appropriateness" of the "green premium" are currently equivocal and left to interpretation, which makes the prevention of “Greenwashing” a challenging task.

From the perspective of supply chains, however, this issue is relatively clear. Large firms and developed economies on the buy side have an incentive to transfer the "non-green" parts of production and transportation processes to SMEs and emerging countries on the supply side.

Such a problem is clearly articulated both as an example of inappropriate fundraising by companies and as unfair transactions with SMEs in advanced economies. In emerging economies, there is another concern about the prevention of climate change adaptation. On a global scale, this lies in the transfer of the burden and risk of climate change without contributing to the goal of substantial GHG emission reduction.

Alternatively, firms need to disclose appropriately that the Green Transformation is being implemented throughout their supply chains and secure investors’ confidence in them if firms seek to implement SCF for Green Transformation through capital markets. Despite the remaining ambiguity around the "appropriateness" of the Green Transformation, there should be certain common ground on which global investors can agree.

Therefore, it is evident that the fundamental framework of information disclosure in capital markets and the associated decision-making by investors can contribute to curbing “Green Washing” through SCF.

The experience of Abu Dhabi

Abu Dhabi Global Market (ADGM) introduced Numou in November 2023, a cutting-edge digital platform tailored to bridge the funding gap faced by SMEs. This innovative digital platform marks a pivotal step in empowering small and medium-sized businesses in the UAE. The aim is to connect SMEs and lenders through a seamless digital platform with features that have been designed to financially empower and support the growth of the SME ecosystem across the UAE.

The innovative digital platform delivers substantial value to each participant, providing key features like:

- For SMEs: Efficiently collect data from various sources to create a comprehensive view of their business that meets lender requirements. The platform also provides SMEs access to a curated network of service providers, such as accountants, auditors, lawyers, etc., who can help them during this process.

- For financial institutions: Facilitating loan application submissions that meet the lender's requirements and enable efficient credit assessment without revalidating originally sourced data.
- For partners and service providers: Granting direct access to SMEs that need their services with the potential for cross-selling value-added services.

Numou has attracted an ecosystem of launch partners that will support SMEs in meeting their finance-related needs.

At launch, the platform will serve SMEs with domestic businesses in the UAE, with a view to expanding the products and services to SMEs seeking to expand their international footprint. To this end, ADGM will work with government counterparts in global business hubs to facilitate cross-border data exchange and trade financing. ADGM is also collaborating with other international centers to build digital corridors by connecting the respective platforms in different geographical locations.

ACTIONS AIMED AT EFFICIENT PRODUCTION AND USE OF INFORMATION

In this chapter, we will review the challenges that individual firms and financial service providers face regarding the essential information for providing SCF for Green Transformation. Afterward, we will discuss the benefits of establishing platforms based on the economic features of information.

Perspectives of financial service providers and individual businesses

SMEs are facing tough challenges in producing and collecting data.

Relevant information regarding the Green Transformation throughout supply chains must be efficiently generated and shared by stakeholders in order for efficient SCF provision for the Green Transformation. If this condition is not satisfied, finance costs might increase, risk sharing may not be properly conducted, and the provision of SCF could become challenging.

What should ultimately be shared is not just data but information. For firms, banks, and capital markets, economic resources in the form of processed and analyzed information rather than raw data are necessary. Such information is crucial for them to understand the rationality of implementing the Green Transformation and its alignment with policy objectives and to agree on the funding conditions, including risk-sharing.

However, firms that constitute supply chains, especially SMEs, face challenges at the data production and collection stage. Among all, the most significant ones are the burden of costs and constraints on resources.

The experience of Malta

Based on insights gathered from the industry, one of the primary challenges in generating and collecting supply chain data is the absence of clear guidelines to facilitate this process. Supply chains often exhibit significant complexity, and without a universally adopted standard, data collection becomes inherently difficult. Moreover, there's a risk of double counting, further complicating the accuracy and reliability of the data. At present, there are no policy measures in place to provide support for firms in this regard.

Over the past years, it has become increasingly clear that enhanced visualization of supply chains could significantly improve the sharing of costs and risks. Nonetheless, implementing such measures appears to pose significant challenges.

In the context of Malta, a small island state, it would be advantageous for the diverse stakeholders involved in global supply chains to cooperate in the collection and analysis of data. This collaborative effort would likely yield greater effectiveness and efficiency, primarily due to the shared involvement of key players within the supply chain. Such cooperation would streamline the process for several reasons, including the adoption of standardized methodologies for impact measurement, the identification of inefficiencies throughout the supply chain, and the pooling of resources to undertake these endeavors collectively. Given the interconnectedness of stakeholders in Malta's supply chains, a collaborative approach makes practical sense and can lead to more comprehensive insights and sustainable solutions.

It would be needless to confirm that leveraging digital technology is effective for the efficient generation and collection of data. However, SMEs often face financial hurdles in making investments in the necessary infrastructure to digitize data on their operations and plans, including the Green Transformation. Additionally, there is often a shortage of personnel to operate and manage the systems after their implementation.

From the perspective of individual firms, especially SMEs, there are disincentives against investing funds and human capital to achieve efficient data production and collection. This is because the benefits of doing so might be difficult to visualize or monetize. This issue can be attributed, in part, to the fact that green finance, including SCF, has not always been able to provide appropriate "green premiums" to firms.

At the same time, especially within the context of supply chains, there are aspects related to the issues arising from "externalities." This means that benefits are difficult to reap unless a significant number of firms collectively adopt such measures. In this sense, it is rational to a certain extent that firms, particularly SMEs, have fewer incentives to produce and collect data more efficiently.

Financial service providers also face challenges in the production and utilization of information.

Generally, large firms not only generate and gather data but also generate information based on it, which can be utilized for business planning and operation purposes, including the Green Transformation. However, from a macroeconomic perspective, banks and capital markets largely undertake the role of processing and analyzing data to produce information to provide financial services.

During the implementation period of SCF for Green Transformation, banks, and capital markets also face various challenges related to information production and its utilization.

The lack of interoperability of information is a representative example. Banks and major investors produce information based on their own systems and frameworks when evaluating Green Transformation-related activities and plans by their customers. As a result, the information used by individual banks and investors generally lacks interoperability, at least in holistic terms.

Chart 13: Challenges for SMEs to deal with data

Internal issues

Issues	Observation	Measures
Human resources	SMEs lack sufficient human resources to develop or install digital platforms	・External consulting ・Re-skilling of staff
Financial resources	SMEs suffer from sufficient funding to renovate or launch digital platforms	・Financial supports (in terms of costs and risks)
Business models	SMEs have difficulties in modifying business models	・External consulting ・Incentives by buyers

External issues

Issues	Observation	Measures
Availability of services	Digital platforms lack affordability for SMEs both in terms of costs and technology	・Innovative solutions ・Financial supports (in terms of costs and risks)
Business motivations	Benefits of digitalization for SMEs remain unclear	・Policy for promotion ・Incentives by buyers

This issue is inevitable, considering that banks and investors set their own evaluation criteria and de facto compete with one another. In addition, since financial service providers have incentives to keep quality trading partners and investment vehicles within their ecosystems, the lack of interoperability is, in a certain sense, an intended outcome.

However, for firms, including SMEs, raising funds from multiple banks and investors is important for the stability of their sources of funding and for risk-sharing. Consequently, each firm within a supply chain has to use different formats every time it provides data for banks and investors so it can create the information it needs.

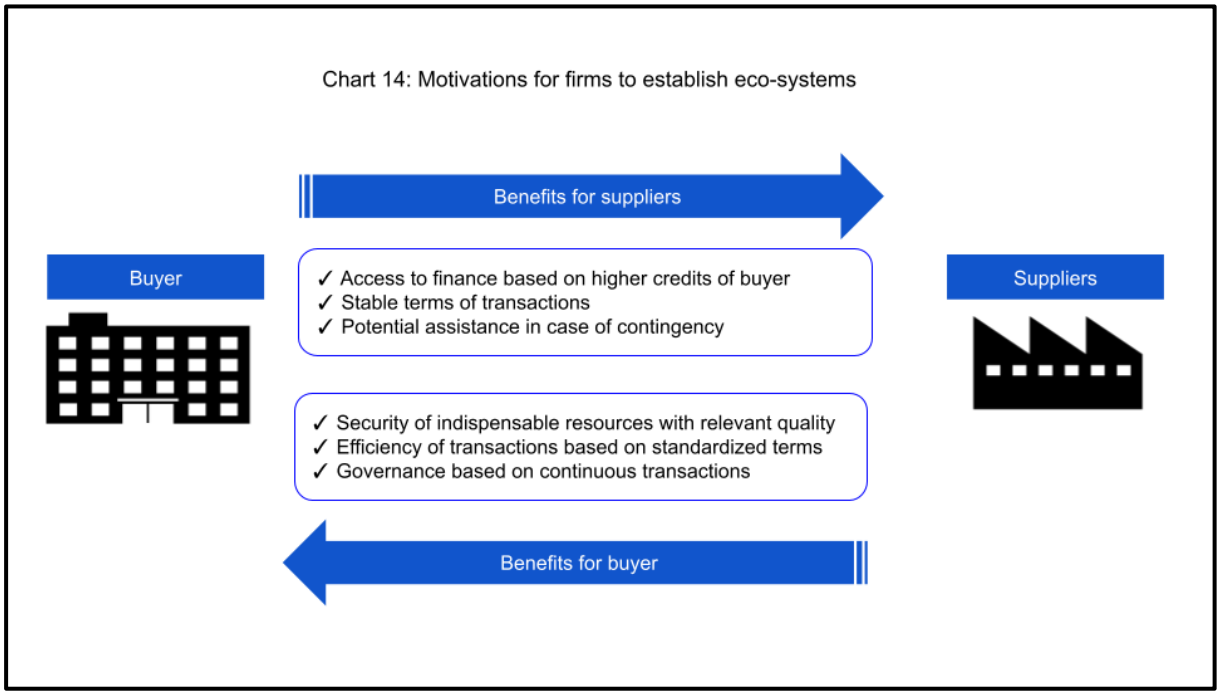
As a result, it remains difficult for individual banks and investors to efficiently increase investment vehicles and trading partners as the recipients of their SCF for the Green Transformation.

Secondly, there is a need to strike a balance with the protection of business information. Banks and major investors often come into contact with business-sensitive information related to trading partners' credits or their Green Transformation activities and plans. Moreover, such insights into these matters often contribute to the appropriate appraisals of risks of transactions and investments.

The experience of Frankfurt

According to surveys, the biggest challenges faced by SMEs in collecting and producing supply chain data are the lack of financial and human resources, the high level of bureaucracy, unclear requirements and legal terms, and, last but not least, a lack of insight into their own supply chain and a lack of understanding of suppliers' requirements. The government tries to address these points by streamlining and mandating sustainability reporting and by creating guidelines for companies.

Simultaneously, banks and major investors are required to appropriately protect the business-sensitive information of their trading partners or investment recipients. This is not only essential for complying with financial regulations but also crucial for maintaining the trust and reputation of banks and investors.



On the other hand, for banks and investors to effectively play their role in SCF for Green Transformation, they must go beyond simple lending or investment and offer a diverse range of finance options with varying degrees of risk-sharing, often referred to as the "finance mix."

“Structured finance" and "asset-based finance," sophisticated methods employed for the “finance mix,” are often provided by different entities even within the same financial group. Moreover, novel financial services that enhance factoring or leasing using digital technologies are often provided by emerging FinTech companies, necessitating collaboration with them.

In these scenarios, uncertainties remain regarding whether or to what extent banks and investors can share the information they have produced and collected, as well as business-sensitive information of their trading partners or investment recipients. In addition, judging whether to share information on a case-by-case basis can become a significant burden for banks and investors.

The experience of Nigeria

Better visualization of supply chains in Nigeria could improve the sharing of costs and risks in implementing the climate transition within those supply chains. Here's why and how:

Identifying Climate Impact Points: Visualizing supply chains can help identify key points where climate-related risks and impacts occur. This includes understanding the carbon footprint of each stage in the supply chain, from production to distribution. By pinpointing these impact points, stakeholders can better assess the environmental risks associated with each stage and allocate resources accordingly to mitigate them.

Supply Chain Transparency: Improved visualization leads to greater transparency within supply chains, allowing stakeholders to trace the origin of products and materials. This transparency enables better identification of environmentally sensitive areas or processes, such as high emissions or deforestation hotspots. With this information, stakeholders can collaboratively develop strategies to address these issues, including sharing the costs of implementing sustainable practices.

Risk Management and Resilience: Visualizing supply chains helps in assessing climate-related risks such as extreme weather events in the Sahel, supply chain disruptions, or regulatory changes. By understanding the vulnerabilities within the supply chain, stakeholders can collectively develop risk management strategies and build resilience. This may involve diversifying sourcing locations, investing in climate-resilient infrastructure, or developing contingency plans for potential disruptions.

Cost Sharing for Sustainable Practices: Implementing climate-friendly practices often involves upfront costs, such as investing in renewable energy sources, adopting eco-friendly transportation methods, or implementing waste reduction measures. Through better visualization and understanding of the supply chain, stakeholders can collectively share these costs based on their contribution to emissions or environmental impacts. For example, manufacturers, distributors, and retailers could share the costs of transitioning to more sustainable agricultural practices across Nigeria.

Incentivizing Collaboration: Visualizing supply chains fosters collaboration among stakeholders towards common sustainability goals. When all parties have a clear understanding of their role within the supply chain and the associated environmental impacts, they are more likely to cooperate in implementing climate-friendly initiatives. This collaboration can lead to shared investments in renewable energy projects, carbon offset programs, or sustainable sourcing practices, ultimately reducing costs and risks for all involved.

In summary, better visualization of supply chains in Nigeria can enhance transparency, facilitate risk management, and incentivize collaboration among stakeholders to share costs and risks associated with implementing the climate transition. By working towards sustainable practices, supply chains can become more resilient, efficient, and environmentally responsible.

The perspective of common platforms as social infrastructure

Utilization of common platforms is an effective solution in overcoming information externalities.

The challenges faced by businesses, banks, and investors, as confirmed in the previous section, are largely related to the characteristics of externalities inherent in dealing with information.

For instance, due to externalities, it is difficult for firms (especially SMEs) to enjoy the benefits of SCF for the Green Transformation unless a majority of firms in supply chains start taking collective actions despite their efforts at an individual level.

Similarly, it is also because of these externalities that banks and investors, in a mutual competition, keep using their own evaluation criteria and tend not to share information about firms. In this regard, firms in supply chains bear the burden of dealing with less interoperable formats of data, which they must provide for each and every bank or investor they work with so that information can be created.

As a result, the firms constituting supply chains face the burden of providing data in the required formats and contents for information production to each bank or investor, which is also influenced by the externalities.

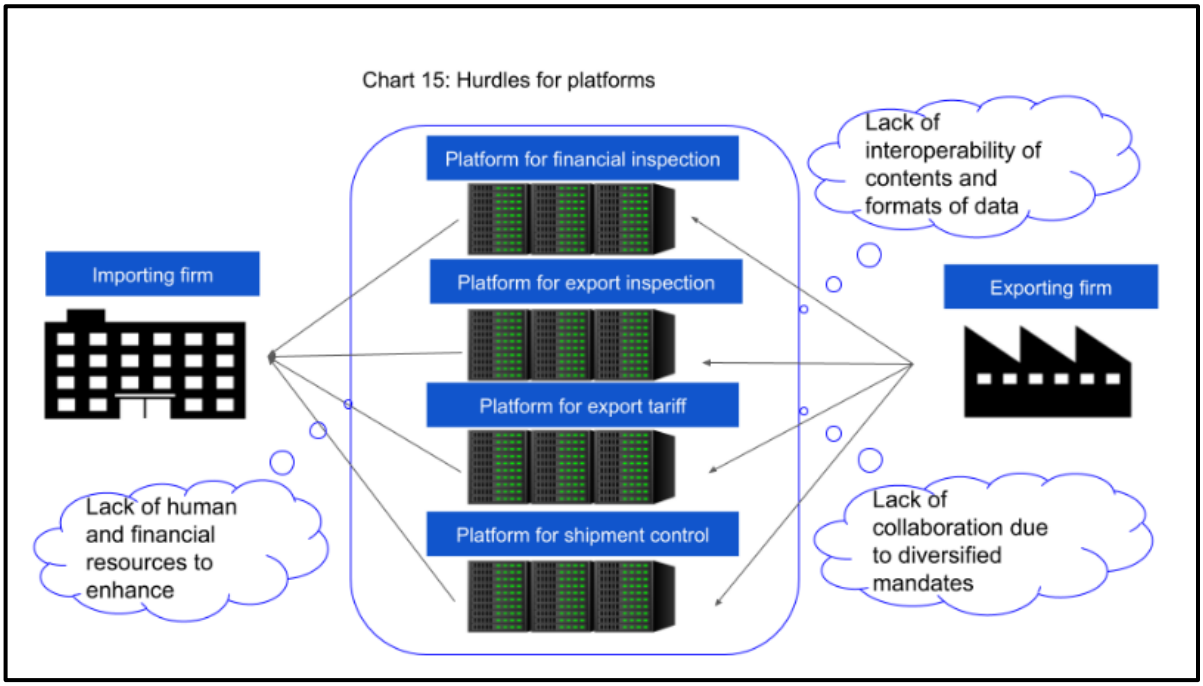
In overcoming the “market failures,” government intervention is usually rational. In this case, a desired intervention is to introduce and operate common platforms.

Platforms efficiently collect, analyze, and process data produced by firms, including SMEs, within supply chains to generate information. Moreover, they are expected to transform and provide information according to the various needs of respective banks and investors.

With the introduction and operation of such platforms, the streamlined flow of data and information facilitates a shared understanding of the rationality and effectiveness of Green Transformation for firms, including SMEs and banks or investors. This contributes to generating the "Green Premium" at appropriate margins, thereby reinforcing incentives on both sides.

Furthermore, by utilizing platforms' data translation function, firms, including SMEs, can satisfy the diverse information needs of different banks and investors without increasing the burden of data production. This approach allows for a better balance between information utilization and business confidentiality.

It is also important to note that government support is necessary and beneficial in addressing the cost and human capital constraints associated with firms, especially SMEs, as they endeavor to produce data for the planning and operation of businesses, including those involving the Green Transformation, within supply chains.



Hurdles remain in introducing and using online platforms.

In both advanced and emerging countries, many platforms already operate to enhance and streamline supply chains or SCF.

However, many of these platforms were originally developed and have been used by different government bodies or industry associations for diverse purposes (such as customs operations, trade inspections, and logistics optimization). Moreover, the data formats and digital technologies used in such platforms are not usually standardized, often because of their diverse origins.

As a result, while each platform serves well the individual purposes for which they were originally designed with better efficiencies, they are not necessarily useful for the implementation of the Green Transformation and the utilization of SCF for the overall enhancement of supply chains. In addition, they also face challenges in terms of the interoperability of data and information, potentially a significant benefit of platforms.

The experience of Dubai

In the UAE, various programs and platforms enhance and streamline supply chains across different sectors, including oil and gas, retail, automotive, healthcare, and construction. These efforts are part of a broader initiative to optimize working capital, improve efficiency, and integrate cutting-edge technology into supply chain financing.

Digital Platforms and Technologies

The UAE is investing in digital platforms and technologies to enhance supply chain financing. This includes using e-invoicing, digital supply chain platforms, and blockchain-based solutions to improve transaction efficiency and transparency. For instance, InvoiceMate is a blockchain and AI-powered invoice financing enabler that acts as a bridge between SMEs and financing institutions, providing industry-specific working capital financing solutions.

Supply Chain Financing Solutions

Commercial banks and financial institutions in the UAE offer a range of supply chain financing services tailored to the needs of businesses involved in supply chains. These services are designed to help businesses optimize their working capital and streamline their supply chain operations. Large buyers can negotiate extended payment terms with their suppliers and then use a bank's financing to pay early at a discounted rate, benefiting

both parties.

Sector-Specific Initiatives

Certain industries, such as logistics, construction, and oil and gas, may have specific supply chain financing programs or initiatives tailored to their unique needs and challenges. For example, the oil and gas sector is a significant part of the UAE's economy, with the country seeking to become self-sufficient in gas supply by 2030 and investing in unconventional oil and gas production. Supply chain financing can support these initiatives by providing the necessary capital for exploration and production activities.

DP World, a leading provider of smart supply chain solutions, offers a financing solution and fintech platform called CARGOES Finance that provides access to finance to support small- to medium-sized businesses.

CARGOES Finance is a new platform that provides exporters, importers, and logistics companies with access to financing solutions to support them in driving global expansion seamlessly. The fintech platform comprises a simple and easy-to-use online application that requires minimal documentation and expedites quick approval decisions supported by intelligent systems.

Key financial solutions available through CARGOES Finance include:

- Trade Finance – Accessing a variety of pre-shipment and post-shipment financing options for international cargo movement, along with extended payment terms.
- Logistics Finance – Accessing financing options for domestic logistics movement, including receivables and payables financing and invoice factoring/discounting.
- Inventory Finance – Utilizing small-to-medium businesses' inventory as collateral for financing their businesses based on the value of stock in their warehouses.

Support for SMEs

Supply chain financing is particularly beneficial for SMEs, helping them access affordable financing options and integrate into larger supply chains. The Emirates Development Bank (EDB), which will contribute to financing 13,500 SMEs under Operation 300 bn, the UAE's industrial strategy, has partnered with Trade Capital Partners (TCP) to offer supply chain finance and working capital solutions to SMBs in the UAE. The aim is to support startups and provide them with commercial opportunities through a network of corporate and government partners.

Sustainable Supply Chain Finance

Sustainable supply chain finance is gaining traction in the UAE as part of broader environmental, social, and governance efforts. This practice involves assessing and providing loans that take into account suppliers' ESG performance, incentivizing more sustainable business practices within supply chains.

It is crucial to consider the challenges mentioned above for economies whose WAIFC members are seeking to establish new platforms for enhancing supply chains, including promoting the Green Transformation.

On the other hand, in economies where multiple platforms have already been established and are being operated by both public and private entities, it would be beneficial to enhance linkages among existing platforms. In doing so, developing a "hub" platform and having it connect together the existing frameworks can be more effective than connecting these individual platforms bilaterally.

From a broader perspective, enhancing interoperability among platforms across multiple economies that constitute closely interconnected supply chains can also be a valuable approach for advancing the Green Transformation throughout supply chains. This can be particularly relevant in regions with high concentrations of high-GHG-emitting industries or closely integrated supply chains related to them.

However, it is important to note that cross-border collaboration among platforms presents new and tough challenges. The number and diversity of stakeholders, both public and private, significantly increases, and the handling of business-sensitive information related to the implementation of the Green Transformation requires higher caution in many aspects.

Furthermore, if we consider factors such as the data and information formats adopted by platforms, the content of adopted digital technologies, and the alignment of definitions regarding the "appropriateness" of the Green

Transformation, our scope of discussion may well include the areas influenced by the diverse stances of relevant governments.

The experience of Surecomp: a global trade finance solutions provider in Japan

Movement is gaining pace across the globe to reform the efficiency of trade and supply chain transactions, which have traditionally relied heavily on paper and manual processing. Leading the charge with a pivotal shift in legislation are the UK, Singapore, and the US, who have now all mandated that digital trade documents have the same legal standing as paper. However, despite its leading economy with a sophisticated banking infrastructure and booming hardware and electronics industries, Japan has been lagging in its adoption of software in this space, further hindered by the lack of regulatory standards and frameworks.

The Japanese trade finance sector - comprising both tier-one mega banks and regional banks - is only now gradually embracing digital technology to streamline processes, reduce paperwork, and improve efficiency. There are increasingly high expectations for banks to move away from the traditional corporate communication channels dominated by paper, fax, and email to radically improve the service and value they deliver to their customers. It's now being recognized that by using technology to link trade finance services to commercial distribution, they can leverage the power of digital to transform customer value and, in turn, their trade and supply chain. Shortening processing times through efficiency gains from tech adoption and breaking away from the high-cost structure caused by a dependence on paper-based manual workflow will eventually lead the Japanese market to follow the lead of other G7 nations and digitize trade finance with full force.

There is already an increased focus on supply chain finance to optimize working capital and improve the overall efficiency of supply chains. This trend was driven by the need to enhance collaboration between various stakeholders in the supply chain and ensure smooth and timely transactions.

Japan is already placing a greater-than-expected emphasis on sustainable finance, with an increasing number of companies and financial institutions incorporating environmental, social, and governance (ESG) factors into their trade finance activities. This trend is in line with global sustainability goals and initiatives seen elsewhere in the world.

Regulatory developments are slowly shaping the trade finance landscape in Japan, with authorities focusing on enhancing transparency, mitigating risks, and ensuring compliance with international trade regulations. Compliance with regulatory standards such as those set by the International Chamber of Commerce (ICC) is gaining importance.

Japan's potential trade finance market is huge; therefore, the growth potential to be realized from efficiency gains is also huge. Trade volumes are already high, with Japan actively exploring new trade opportunities to diversify its trade portfolio and expand its global reach, particularly with emerging markets in Asia and Africa. This has involved the development of specialized trade finance products and services tailored to the needs of businesses engaging in trade with these regions. Although the majority of this business resides with the mega banks, regional banks also play an important role in supporting the SME corporate market. While transaction volumes may be lower, there is a shift towards SMEs trading more internationally to fuel future economic development, which the regional banks need to be ready to support.

Aside from trade and supply chain finance transaction processing efficiency, digitization has extended benefits from a risk and compliance perspective. Security, anti-money laundering (AML), and combating terrorism financing (CTF), along with the global rise in geopolitical risks, the increasing sophistication of criminal methods, and strengthening Trade-Based Money Laundering checks (TBML), are all increasingly important.

While original paper-based trade finance still remains, regulatory bodies are starting to wake up, and the Model Law on Electronic Transferable Records (MLETR) legislation is already in place across the G7, supporting the use of digital trade documents. It is surely only a matter of time before Japanese banks reap the rewards of easily deployed global standard solutions in their local language to assume their place at the top of the digital trade transformation tree in Asia.

Elsewhere on the continent, PT. Bank BTPN Tbk (Bank BTPN) - the first digital retail bank, one of the leading privately-owned banks in Indonesia, and a subsidiary of the Japanese SMBC Group - is already using Surecomp's DOKA™ solution to drive streamlined back-office trade finance processing automation. Bank

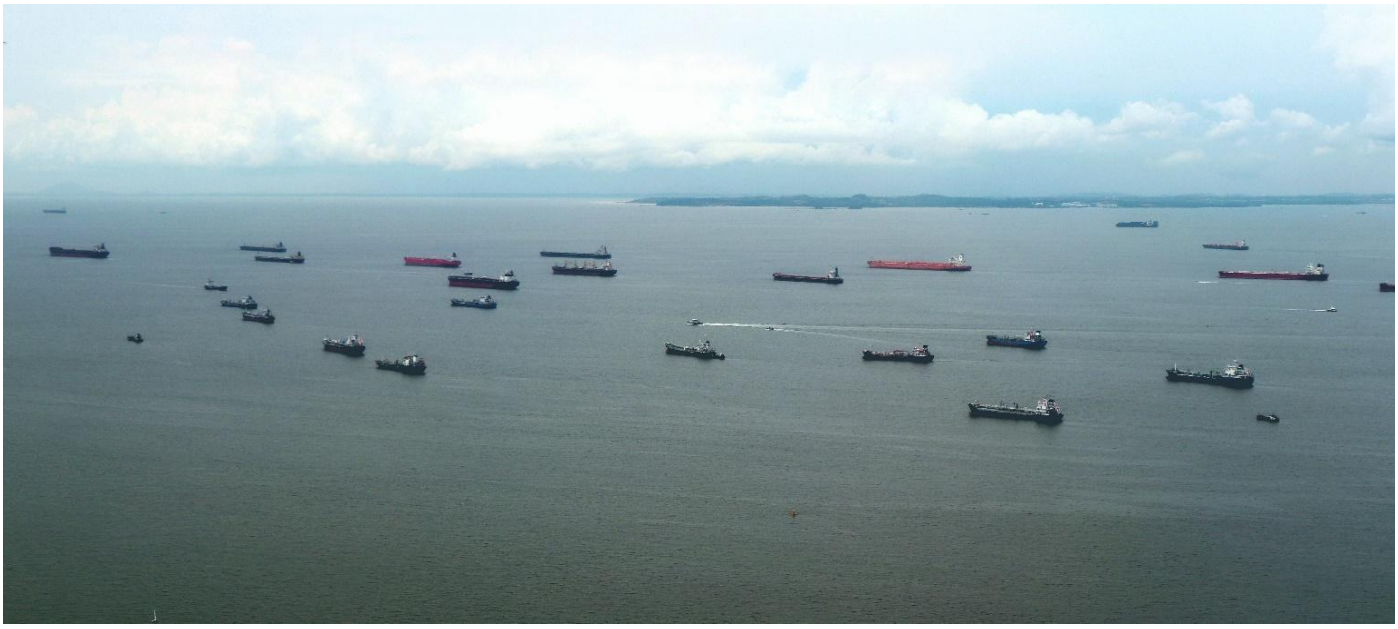
BTPN has a large MNC customer base, along with a growing number of local and state-owned SMEs, which have historically lacked trade and supply chain finance support. Primarily a commodities export market of palm oil and nickel, Indonesian companies working with Bank BTPN now benefit from a more efficient customer service supported by expedited processing of their growing trade finance requests in the form of Letters of Credit (LCs), documentary collections as well as trade loans.

The DOKA™ solution, which has replaced the bank's previous trade finance application, is hosted in Jakarta and has been fully deployed and supported by Surecomp's local teams in Asia. Through seamless integration with the bank's other trade-related systems for limits and position management, sanction screening, SWIFT connection, collateral management, and core banking, Bank BTPN has future-proofed its trade finance business by partnering with Surecomp.

"Technology is evolving so rapidly that I don't believe trade finance is a domain banks can afford to tackle on their own," explains Intan Wijaya, Head of Transaction Banking and Supply Chain at Bank BTPN. "With so many parties involved, it commands collaboration, cooperation, and partnership. It is important to be flexible and open to working with expert solution providers to act in the customers' best interest. The Surecomp team demonstrated robust functionality and a deep understanding of our needs, and they built a trust upon which we can future-proof our trade finance business."

DESIRABLE POLICY ACTIONS AND FUTURE VISIONS OF SCF FOR GREEN TRANSFORMATION

In the final chapter of this White Paper, building upon the discussions from the previous chapters, we aim to showcase the desirable policy options. Furthermore, we will outline the expected outcomes for the future if these policy measures are adequately implemented.



Options for policy actions

Tailored actions are desirable in order to align with respective structures of finance.

For the smooth provision of SCF for the Green Transformation, as seen in the previous chapters, the starting point is for firms driving the Green Transformation to produce and gather appropriate data and then for banks and capital markets to process and analyze such data in order to generate information.

Surpassing constraints such as costs, expertise, and human capital is necessary for SMEs to produce and collect data, which makes the policy measures to support these aspects all the more significant. These prescriptions and support align closely with efforts to facilitate SME finance in a broader sense.

On the other hand, banks and capital markets possess the capacity for information production.

In order to enhance their incentives and effectively generate a "Green Premium," the following two measures are mutually reinforcing.

- The development of a suitable disclosure framework for supply-chain-wide Green Transformation.
- The development of a mechanism for the private sector to share the cost and risk of business development and innovation with the public sector.

Overcoming the externalities associated with SCF for Green Transformation also involves introducing and utilizing data and information platforms, as discussed before. Government and public institutions can play a meaningful role in implementing and operating these platforms.

However, in the economies of some WAIFC members, some of these prescriptions may not be as effective. For example, as the relative importance of banks and capital markets in financial intermediation differs from one economy to another, the desirable approaches would naturally vary to tackle various issues such as data production, disclosure frameworks, and burden (cost and risk) sharing mechanisms with the government.

Furthermore, considering that many governments, both in advanced and emerging countries, face fiscal constraints, it is necessary to clarify the prioritization of policy goals such as tax policies and subsidies when utilizing fiscal tools. The extent to which governments and public institutions should intervene with firms, banks, and capital markets for the promotion of Green Transformation through supply chains is likely to vary among countries.

Considering these aspects, it is desirable for WAIFC members to identify the optimal policy choices based on a solid understanding of their respective economies' financial and economic structures and promote their implementation in collaboration with public and private stakeholders.

Exploration of collaboration among WAIFC members is beneficial.

Concerted efforts are desirable, not only because preventing climate change requires a global response but also for the smooth provision of SCF for the Green Transformation. This is because the transformation of entire supply chains inevitably affects the cross-border flow of goods and services.

The experience of Abu Dhabi

Singapore's Infocomm Media Development Authority (IMDA), the Monetary Authority of Singapore (MAS), and the Financial Services Regulatory Authority (FSRA) of Abu Dhabi Global Market (ADGM), in collaboration with several commercial banks, concluded in 2021 the world's first cross-border digital trade financing pilot.

The pilot used IMDA's TradeTrust framework to facilitate the transfer of electronic records between jurisdictions that have adopted the United Nations Commission on International Trade Law (UNCITRAL) Model Law on Electronic Transferable Records (MLETR).

Cross-border trade finance is largely paper-based and vulnerable to fraud due to the complex flow of transactions and the multiple number of parties involved. Singapore's Infocomm Media Development Authority (IMDA) developed an interoperable framework that provides proof of authenticity, origin, and ownership of digital documents used in trade finance. This enables trading counterparties and transacting banks to validate documents digitally and securely even when they are on different trade finance platforms and allows such documents to be exchanged with another party in real time. This helps mitigate the risk of fraud, reduce costs, and improve trust and efficiency in the cross-border supply chain.

Trade finance is a key enabler for the continuing development and growth of the global economy. As an international financial center, ADGM is delighted to work with other MLETR-compliant jurisdictions to provide robust and efficient regulatory and technical infrastructure that helps financial institutions better serve their corporate customers' needs.

Digitizing paper-based trade finance: France's incoming law

At a global level, less than 0.1% of the 4 billion new documents produced each year in international trade were digitized in 2022. Indeed, too many documents, including some of those most used in international trade, such as bills of lading, are historically paper-based and signed manually, significantly hampering cross-border exchanges and supply chain transformation towards a more sustainable economy.

Greening legal systems is therefore crucial, meaning the latter should recognize the evidential value of the electronic value of "transferable" documents, such as documentary credit, letters of credit, and international guarantees. The adoption by the United Nations Commission on International Trade Law (UNCITRAL) of a Model Law on Electronic Transferable Records provides a key benchmark for a quick implementation of legal frameworks conducive to the digitization of international trade's documentary flows. Greening supply-chain financing through digitization, including cost reduction for financial intermediaries and businesses, may improve the security and traceability of transactions and widen access to financial products for companies operating internationally.

Paris Europlace, in accordance with the mandate given by the French government, released a report in 2023 to speed up the digitization of trade finance. Following these recommendations, a law proposal (French version here) was published in March 2024 to enact, in particular, the proposals aimed at suppressing many paper-based documents in international trade, including bills of exchange, promissory notes, maritime and river bills of lading, daily certificates, bearer and order insurance policies, and warrant receipts.

The French Parliament will discuss this draft law in early April. Paris Europlace will continue in the coming months to boost its recommendations aimed at fostering the TradeTech ecosystem, promoting regulatory frameworks for paperless trade, and establishing digital corridors with major trading partners.

In the previous chapters, we examined the significance of interlinking platforms among economies for the production of data and information. In recent years, the utilization of digital currency-based technologies has also emerged as a potential option for the future.

By settling transactions in the flow of goods and services within supply chains using digital currencies, digitized data related to these transactions can be automatically generated. This, in turn, significantly enhances the efficiency of data collection and information production and improves interoperability.

Moreover, digital currency can facilitate the introduction of a common platform and its more efficient operations. Various digital technologies can analyze and process data and information regarding the flow of goods, services, and financial transactions interchangeably. It is evident that these benefits enhance firms' access to funding, including SMEs, and facilitate the distribution of costs and risks among stakeholders.

At present, no practical cases have been launched in which digital currencies are used in full to settle transactions through supply chains among major and emerging countries. However, international organizations and central banks in Asia and Europe are progressing with verification. From a technological standpoint, the feasibility of implementation is anticipated to increase in the near future.

Various complex challenges need to be overcome in order to realize the collaboration between economies in the practice of SCF for the Green Transformation, whether with a common platform or with digital currencies.

Nevertheless, partial collaboration between economies can still yield certain effects as an initial step. For instance, economies with closely connected supply chains could harmonize data and information formats for customs clearance, trade inspections, and management of logistics. This alone could enhance the visibility of supply chains, thus facilitating the production of data and information by relevant firms, banks, and capital markets.

It is also beneficial for members of the WAIFC to start with more feasible and more relevant areas from the viewpoint of respective policy needs in collaboration between the public and private stakeholders.

The experience of Dubai

Better visualization of supply chains in Dubai and the UAE can significantly improve the sharing of costs and risks associated with implementing the climate transition in those supply chains. Enhanced visibility and transparency, for example, facilitated by AI-powered technologies, can play a crucial role in this process.

Enhanced Visibility and Transparency

AI-powered technologies enable real-time data collection, analysis, and visualization, enhancing visibility and transparency throughout the supply chain. This allows companies to track and trace products, monitor energy consumption, and identify inefficiencies. With better visibility, firms can target interventions more effectively, optimize processes, and identify sustainable alternatives, thereby sharing and mitigating the costs and risks associated with climate transition.

Risk Mitigation and Resilience

AI-driven technologies contribute to risk mitigation and resilience within supply chains. Predictive analytics help identify potential disruptions, such as extreme weather events or supplier failures, and develop contingency plans. This proactive approach allows companies to share and manage the risks associated with climate change more effectively, ensuring that supply chains are more resilient to environmental impacts.

Collaboration and Innovation

Digital platforms, cloud-based solutions, and AI-powered analytics enable seamless communication, collaboration, and data sharing among supply chain stakeholders. This interconnectedness promotes the exchange of best practices, accelerates innovation, and drives collective action towards sustainability goals. By fostering collaboration, companies can share the costs and risks of implementing climate transition measures, leveraging collective resources and knowledge to achieve a more significant impact.

Sustainable Supplier Management

AI-based tools facilitate the assessment and monitoring of suppliers' sustainability practices, helping companies make informed decisions based on environmental criteria. Through AI-driven supplier scorecards, companies can identify high-performing and environmentally responsible suppliers, fostering a network of sustainability-focused partners. This approach helps distribute the costs and risks associated with climate transition across the supply chain, ensuring that all participants contribute to and benefit from sustainable practices.

Policy Support and Public-Private Partnerships

The UAE government is actively supporting climate change action and sustainability initiatives, emphasizing the importance of public-private partnerships. By engaging in these partnerships, companies can leverage government support and resources to share the costs and risks associated with climate transition. Initiatives like the Green Procurement Policy aim to stimulate the local supply chain, adopt more sustainable practices, and reduce the environmental footprint.

PROSPECTS OF SUPPLY CHAIN GREEN TRANSFORMATION THROUGH SCF

SCF for Green Transformation paves the way for rational and efficient responses utilizing digital technologies.

The smooth provision of SCF for Green Transformation can be seamlessly achieved through the production and utilization of digitized data and information. In other words, generating and utilizing data and information through digital technologies can overcome various challenges, leading to the rational and efficient realization of the overarching goal of transforming entire supply chains for sustainable growth of the global economy.

As we have seen in each chapter so far, the benefits mentioned above can have a broad impact on various stakeholders involved in supply chains. They provide support not only to firms conducting Green Transformation, including SMEs but also to banks and capital markets that provide financial services and even governments aiming to reduce GHG emissions. All in all, each of those respective missions can be efficiently pursued.

Furthermore, the data and information related to the implementation of the Green Transformation through

supply chains, being digitized and stored in a form suitable for analysis and processing, are also expected to pave the way for accurate economic evaluations of GHG emissions and precise estimations of costs required for their reduction.

The former is undoubtedly essential and useful for introducing and activating carbon pricing and indispensable for appropriately levying carbon taxes.

SCF for Green Transformation enables the effective sharing of costs and risks in terms of space and time.

By processing and analyzing data and information related to implementing the Green Transformation through supply chains using digital technologies, it becomes possible to visualize the geographic distribution of and changes over time in the costs of GHG emissions and absorption.

In fact, various international organizations and private entities have embarked on attempts, though preliminary, to estimate and publicly disclose the differences and trends in the costs of GHG emissions and absorption for major global economic regions.

Such insights offer a rational foundation for SMEs and other firms to appropriately share the costs and risks associated with business investments and innovations for the Green Transformation with banks, capital markets, and governments.

This is because distributing costs and risks among a wide range of stakeholders in a balanced manner regarding geographies or time horizons can effectively alleviate the overall burden on the macroeconomic level.

In this sense, the significance of realizing the Green Transformation through SCF becomes evident once again. As repeatedly emphasized throughout this White Paper, SCF possesses the apparent benefit of paving the way for the optimal sharing of costs and risks as a financial methodology.

CONCLUSION

Based on the contributions from WAIF members, we have learned the following:

- Each market/ international financial is seriously making an effort to green its domestic and cross-border supply chains
- There are emerging and competing frameworks
- An increasing number of technologies are introduced to the market; however, these are not compatible with other
- Global rules and regulations tend to be driven by developed and consumption markets, such as the EU, US, and Japan
- However, these global rules and regulations are not necessarily feasible for SMEs, especially in emerging markets, to implement
- On the other hand, a significant portion of global GHG emissions are taking place towards the end of the global supply chains, namely SMEs in Emerging Markets

Based on the above-mentioned findings, WAIFC, in conjunction with the respective market participants, supply chain constituents, and regulators, will take the following actions.

- Showcase green and digital supply chain finance transformation taken by Emerging IFCs
- Share the lessons learned from each case example using plain language (i.e., minimizing acronyms and technical jargon)
- Discuss how to make the existing frameworks and rules more digestible and understandable for SMEs instead of making these frameworks and rules more sophisticated (and burdensome).

Given the broad coverage and diversity of its membership, WAIFC is well-positioned to positively influence the end-to-end supply chains from green and digital perspectives.

WAIFC worldwide

WAIFC facilitates cooperation between its members, exchanging best practices and communicating with the general public. Its members are government agencies, associations, and similar institutions developing and promoting their financial centers.

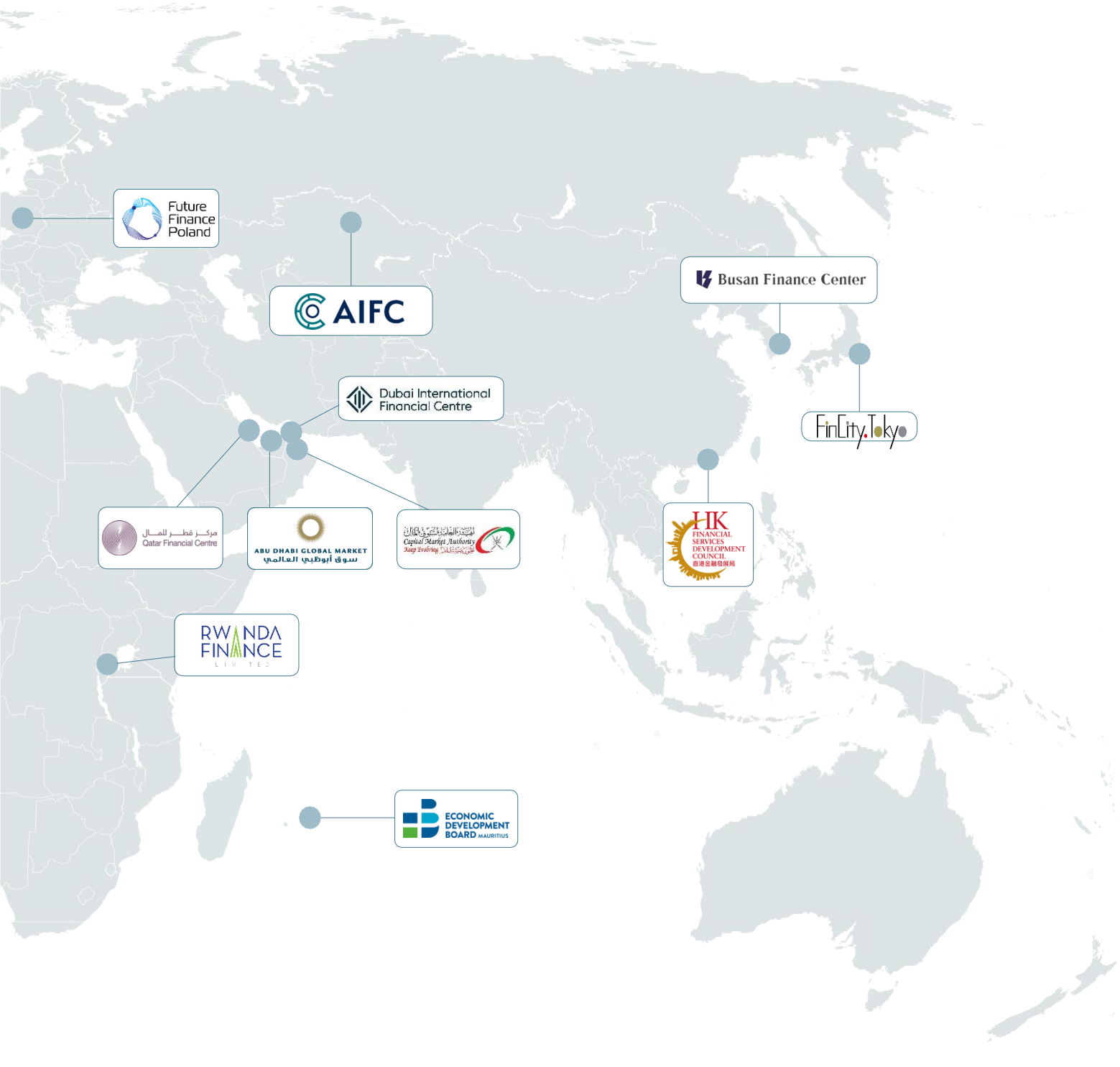
Directory

EUROPE				
CITY	ORGANISATION	WEBSITE	TWITTER	EMAIL
Frankfurt	FMF	https://frankfurt-main-finance.com	@FMFdigital	info@fmfinance.de
Jersey	Jersey Finance	https://www.jerseyfinance.je	@jerseyfinance	jersey@jerseyfinance.je
London	TheCityUK	https://www.thecityuk.com	@TheCityUK	info@thecityuk.com
Luxembourg	LFF	https://www.luxembourgforfinance.com	@LuxFinance	lff_market_intelligence@lff.lu
Malta	FinanceMalta	https://financemalta.org	@FinanceMalta	info@financemalta.org
Paris	Paris Europlace	https://www.paris-europlace.com	@europlace	contact@paris-europlace.com
Stuttgart	Stuttgart Financial	https://www.stuttgart-financial.de	@StgtFinancial	info@stuttgart-financial.de
Warsaw	Future Finance Poland	https://futurefinancepoland.com		

ASIA / PACIFIC				
Astana	AIFC	https://aifc.kz	@AIFC_KZ	info@aifc.kz
Busan	BFC	https://www.kbfc.or.kr/eng	@BusanFinanceCtr	info@kbfc.or.kr
Hong Kong	FSDC	https://www.fsdc.org.hk	@FSDCHK	enquiry@fsdc.org.hk
Tokyo	FinCity.Tokyo	https://fincity.tokyo	@FinCityTokyo	contact@fincity.tokyo

MIDDLE EAST				
Abu Dhabi	ADGM	https://www.adgm.com	@ADGlobalMarket	info@adgm.com
Dubai	DIFC	https://www.difc.ae	@DIFC	info@difc.ae
Muscat	CMA	https://www.cma.gov.om	@cmaoman	info@cma.gov.om
Doha	QFC	https://www.qfc.qa	@QFCAuthority	contact@qfc.qa

AFRICA				
Casablanca	CFC	https://www.casablancafinancecity.com	@CasaFinanceCity	contact@cfca.ma
Kigali	Rwanda Finance	https://www.rfl.rw	@Kigali_IFC	info@rfl.rw
Lagos	EnterpriseNGR	https://enterprisengr.com	@enterprisengr_	contactus@enterprisengr.com
Mauritius	EDB Mauritius	https://www.edbmauritius.org	@EDBMauritius	contact@edbmauritius.org


Future Finance Poland
AIFC
Busan Finance Center
Dubai International Financial Centre
FinCity.Tokyo
مركز قطر للمال
Qatar Financial Centre
ABU DHABI GLOBAL MARKET
سوق أبوظبي العالمي
Capital Market Authority
HK FINANCIAL SERVICES DEVELOPMENT COUNCIL
RWANDA FINANCE LIMITED
ECONOMIC DEVELOPMENT BOARD MAURITIUS

WORLD ALLIANCE
of International Financial Centers

World Alliance of International Financial Centers (WAIFC)
International non-profit association
208 Avenue Louise, 1050 Brussels, Belgium
www.waifc.finance @WAIFC_ info@waifc.finance www.linkedin.com/company/waifc