



# ASIA-PACIFIC TRADE FACILITATION REPORT 2019

## BRIDGING TRADE FINANCE GAPS THROUGH TECHNOLOGY

---

SEPTEMBER 2019



# **ASIA–PACIFIC TRADE FACILITATION REPORT 2019**

## **BRIDGING TRADE FINANCE GAPS THROUGH TECHNOLOGY**

---

SEPTEMBER 2019



Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO)

© 2019 Asian Development Bank  
6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines  
Tel +63 2 632 4444; Fax +63 2 636 2444  
[www.adb.org](http://www.adb.org)

ESCAP has granted permission to use ESCAP-copyrighted material for this Work, and to make the material available under an open access license.

Some rights reserved. Published in 2019.

ISBN 978-92-9261-730-1 (print), 978-92-9261-731-8 (electronic)  
Publication Stock No. SPR190433-2  
DOI: <http://dx.doi.org/10.22617/SPR190433-2>

The views expressed in this publication are those of the authors and do not necessarily reflect the views and policies of the Asian Development Bank (ADB) or its Board of Governors or the governments they represent.

ADB does not guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequence of their use. The mention of specific companies or products of manufacturers does not imply that they are endorsed or recommended by ADB in preference to others of a similar nature that are not mentioned.

By making any designation of or reference to a particular territory or geographic area, or by using the term “country” in this document, ADB does not intend to make any judgments as to the legal or other status of any territory or area.

This work is available under the Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO) <https://creativecommons.org/licenses/by/3.0/igo/>. By using the content of this publication, you agree to be bound by the terms of this license. For attribution, translations, adaptations, and permissions, please read the provisions and terms of use at <https://www.adb.org/terms-use#openaccess>.

This CC license does not apply to non-ADB copyright materials in this publication. If the material is attributed to another source, please contact the copyright owner or publisher of that source for permission to reproduce it. ADB cannot be held liable for any claims that arise as a result of your use of the material.

Please contact [pubsmarketing@adb.org](mailto:pubsmarketing@adb.org) if you have questions or comments with respect to content, or if you wish to obtain copyright permission for your intended use that does not fall within these terms, or for permission to use the ADB logo.

Corrigenda to ADB publications may be found at <http://www.adb.org/publications/corrigenda>.

Notes:

In this publication, “\$” refers to United States dollars.  
ADB recognizes “Hong Kong” as Hong Kong, China; “China” as the People’s Republic of China; “Korea” as the Republic of Korea; and “Vietnam” as Viet Nam.

Cover design by Achilleus Coronel.

# CONTENTS

---

TABLES, FIGURES, AND BOXES	v
FOREWORD by Armida Salsiah Alisjahbana, ESCAP	viii
FOREWORD by Bambang Susantono, ADB	ix
ACKNOWLEDGMENTS	x
ABBREVIATIONS	xi
HIGHLIGHTS	xii
<b>DIGITAL AND SUSTAINABLE TRADE FACILITATION IN ASIA AND THE PACIFIC</b>	<b>1</b>
<b>1 Trade Costs and Trade Facilitation in Asia and the Pacific: State of Play</b>	<b>2</b>
<b>1.1</b>   Trade Costs: Subregional Trends	2
<b>1.2</b>   Implementation of Digital and Sustainable Trade Facilitation Measures	4
1.2.1 Status of implementation	4
1.2.2 Progress in implementation from 2017 to 2019	13
<b>2 Impact of Trade Facilitation on Trade Costs</b>	<b>15</b>
<b>2.1</b>   Model and Data	15
<b>2.2</b>   Regression Analysis Results	17
<b>2.3</b>   A “What-If” Analysis	17
<b>3 Conclusion and Way Forward</b>	<b>21</b>
<b>THEME CHAPTER: BRIDGING TRADE FINANCE GAPS THROUGH TECHNOLOGY</b>	<b>25</b>
<b>1 Introduction</b>	<b>26</b>
<b>2 The Trade Finance Market</b>	<b>28</b>
<b>2.1</b>   Market Structure	28
<b>2.2</b>   Risk Management through Trade Finance	33
<b>2.3</b>   Policy-Oriented Trade Finance	34

<b>3</b>	<b>Unmet Demand and Key Challenges in the Trade Finance Market</b>	40
<b>3.1</b>	Persistent, Large Trade Finance Gap	40
<b>3.2</b>	Three Major Challenges in the Trade Finance Market	43
3.2.1	Process inefficiency	43
3.2.2	Regulatory requirements	45
3.2.3	Information asymmetry	48
<b>4</b>	<b>Opportunities in Trade Finance: The Role of Technology</b>	51
<b>4.1</b>	Potential and Progress	52
<b>4.2</b>	Issues and Constraints	58
<b>5</b>	<b>Conclusion and Policy Considerations</b>	63
<b>5.1</b>	How to Strengthen Support for Small and Medium-Sized Enterprise Trade Finance	63
<b>5.2</b>	How to Promote Technology Adoption and Implementation	65
<b>5.3</b>	How to Reduce the Knowledge Gap for Trade Finance	70
<b>ANNEXES</b>		80
<b>1</b>	Size of the Trade Finance Market, 2017	80
<b>2</b>	Export Credit Agencies and EXIM Banks in Asia and the Pacific	82
<b>3</b>	Use of Technology in Trade Facilitation and Trade Finance	84

# TABLES, FIGURES, AND BOXES

---

## DIGITAL AND SUSTAINABLE TRADE FACILITATION IN ASIA AND THE PACIFIC

### TABLES

1	Intraregional and Extra-Regional Comprehensive Trade Costs in Asia and the Pacific, 2012–2017	3
2	Trade Facilitation Measures in the Global Survey on Digital and Sustainable Trade Facilitation	5
3	Most and Least Implemented Measures in Asia and the Pacific	12
4	Data Source, Definition, Treatment, Source, and Expected Sign	16
5	Trade Cost Model Results	18
6	Changes in International Trade Costs of Asia and the Pacific as a Result of World Trade Organization Trade Facilitation Agreement Implementation	19
7	Changes in Trade Cost of Asia and the Pacific from Better Port Connectivity and Trade Finance	20

### FIGURES

	Overall Implementation of Trade Facilitation Measures in 46 Countries of Asia and the Pacific, 2019	xiii
	Trade Flows and Technologies	xv
1	Trade Costs of Asia and Pacific Subregions with Large Developed Economies, 1996–2016	3
2	Overall Implementation of Trade Facilitation Measures (46 Asia and Pacific Countries)	8
3	Trade Facilitation Implementation across Asia and Pacific Subregions and Countries with Special Needs	9
4	Implementation of Groups of Trade Facilitation Measures	10
5	Trade Facilitation Implementation, 2017–2019	14
6	Implementation of Groups of Trade Facilitation Measures, 2017–2019	14
7	Toward Seamless International Supply Chains: Moving Up the Trade Facilitation Ladder	22

### BOXES

1	Implementation of the World Trade Organization Trade Facilitation Agreement in Asia and the Pacific: 2 years on	7
2	Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific: An Update	7

**THEME CHAPTER: BRIDGING TRADE FINANCE GAPS THROUGH TECHNOLOGY****TABLES**

1	Market Share by Transaction Type (2017)	28
2	Differences between Factoring and Forfaiting	31
3	Trade Finance Transactions of International Organizations	37
4	Technology and Financial Services in Trade Finance	52
5	Potential Benefits of Available Technology	53
6	Blockchain-Based Trade Finance Applications	57

**FIGURES**

1	Trade Finance Applications in Value by Region (2016)	29
2	Confirmed Letter of Credit Transactions	30
3	Letter of Credit Volume on SWIFT, 2011–2017	30
4	Open Account and Cash-in-Advance	31
5	Supply Chain Finance/Payable Finance	32
6	Priority Areas for Bank Development and Strategic Focus	32
7	Degree of Risk by Transaction Type	33
8	Trade Finance Provided by Export Credit Agencies	35
9	Asian Development Bank's Trade Finance Program Credit Guarantee	38
10	Global Trade Finance Gap, 2014–2018 and Rejection by Region, 2016	40
11	Trade Finance Rejections by Firm Size, 2018	41
12	Possibility of Finding Alternative Sources of Trade Finance	41
13	Degree to Which Banks Implement Removal of Physical Paper for Documentary Transactions	43
14	Risks in Letter of Credit Transactions	45
15	Obstacles and Concerns in Trade Finance Growth	46
16	Expected Impact of Regulatory Requirements	47
17	Reasons Banks Reject Trade Finance Applications	50
18	Trade Flows and Technologies	51
19	Technology's Effects on Bank's Ability to Conduct More Transactions	54
20	Use of Technology by Export Credit Agencies	54



21	Advantages of Blockchain Documentary Trade over Traditional Processes	55
22	Open Account: Traditional versus Digital Platforms	56
23	State of Digitalization	60
24	Reasons to Not Use Technology	60
25	Three Initiatives to Build an Environment Conducive to Technology Adoption	69

## BOXES

1	Export Credit Agency Support for Small and Medium-Sized Enterprises in Thailand and the Republic of Korea	35
2	Case Studies: Asian Development Bank's Trade Finance Support in Developing Economies	38
3	Empirical Assessment on the Impact of Access to Finance for Small and Medium-Sized Enterprises	41
4	Fraudulent Activities in Trade Finance Transactions	44
5	Know-Your-Customer Compliance Costs and Client Onboarding Time	47
6	Major Basel III Changes on Trade Finance	49
7	Technology in Trade Finance: Findings from a Theoretical Approach	59
8	Technology Adoption in Trade Finance: Lessons from the Bank Payment Obligation	61
9	Asian Development Bank's Support for Spreading Technologies That Impact Sustainable Development Goals	65
10	Establishing a Regional Export Credit Agency in Asia	66
11	Lessons Learned from Single Window "Interoperability"	67
12	Legal Entity Identifier System	71

# FOREWORD

By Armida Salsiah Alisjahbana, ESCAP



International trade has been recognized as a key means of implementing the 2030 Agenda for Sustainable Development. It supports economic growth and the efficient use of resources. Yet despite these indisputable positive effects, lack of adequate social policies to support those adversely affected by trade has led to a backlash against multilateralism. Strong disagreements have emerged on how and whether to “promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the WTO,” a target of the 2030 Agenda for Sustainable Development. Since 2018, growing unilateral protectionism has threatened economic growth and the achievement of the Sustainable Development Goals, as ad hoc trade policy decisions disrupt global value chains and lead to job displacements.

In this context, regional cooperation is more important than ever. It is the only way to curb protectionism and move toward a constructive reform of the multilateral trading system. Regional collaboration can make trade easier, faster, and cheaper. Cross-border trade digitalization, or the simplification and digitalization of international trade procedures, will help all firms in the Asia–Pacific region, particularly small and medium-sized enterprises (SMEs), which are the most vulnerable to trade uncertainty. The Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific—a United Nations treaty developed by more than 25 countries at very different stages of development—provides a means to accelerate progress, while leaving no one behind.

This year’s *Asia–Pacific Trade Facilitation Report* reviews the progress toward trade facilitation implementation in the region and provides an in-depth analysis to help bridge the gaps in trade finance, an essential tool to ensure more inclusive participation in trade. Asia–Pacific economies are making considerable progress toward trade facilitation. Further implementation of digital trade facilitation measures could reduce trade costs by an average of 16%, almost double the current worldwide average tariff rate. Making international trade easier, more transparent and more efficient would not only make trade speedier and eco-friendly but could boost trade more than removing every tariff in the world.

Effective trade facilitation implementation and trade digitalization require inclusive and holistic approaches. Greater and wider access to trade finance is needed. The report highlights the need for specific measures targeted at SMEs and women, as well as for the agricultural sector, given their importance for inclusive development in this region.

I hope this report will help the design of trade facilitation strategies that support sustainable development at this critical moment for the future of global trade.

A handwritten signature in black ink, appearing to be 'A. S. Alisjahbana'.

**Armida Salsiah Alisjahbana**

Under-Secretary-General of the United Nations and  
Executive Secretary, United Nations Economic and Social Commission for Asia and the Pacific

# FOREWORD

By Bambang Susantono, ADB



International trade is an important driver of economic growth and poverty reduction, especially for developing economies. While technological advances and lower trade barriers have significantly reduced trade costs for these economies, nontariff barriers continue to hamper access to international markets. Trade facilitation is critical for developing economies to join global and regional value chains, participate in international trade, and achieve their development goals.

The *Asia-Pacific Trade Facilitation Report 2019* provides an update on trade facilitation in the Asia and Pacific region and the related impacts on trade costs. It examines in detail trends in paperless trade and transit facilitation and reports on progress in trade facilitation for small and medium-sized enterprises (SMEs), women, and some sectors such as agriculture trade.

The report also features a special chapter on trade finance. Trade-related business activities and transactions usually require working capital and hence financing. Some 40% of global goods trade is supported by bank-intermediated trade finance, while the remaining 60% uses interfirm trade credit. Access to trade finance allows businesses to cover operating costs and mitigate the risks of nonpayment by the counterparty, exchange rate fluctuations, damage in transit, or political unrest that are inherent in international trade. Compared to advanced economies with more developed financial systems, the scarcity of trade finance in developing economies is a challenge for trading firms, particularly for SMEs.

The global trade finance gap is estimated at about \$1.4 trillion–\$1.6 trillion, or around 8%–10% of global goods trade. Around half of global trade finance proposals are submitted by businesses registered in Asia and the Pacific. The region accounts for about 40% of rejected applications worldwide. Banks are more likely to reject the proposals of SMEs than of larger firms because SME proposals are costlier to process. It is more expensive, for example, for banks to obtain anti-money-laundering and know-your-customer information about SMEs than about larger firms. The continued use of paper-based transactions, cumbersome due diligence requirements for banks, and lack of adequate business information on borrower firms, especially SMEs, are key challenges in trade finance provision.

Rapid developments in digitalization and automation hold great promise in addressing these challenges. New technologies, such as distributed ledger technology and artificial intelligence, can significantly reduce process inefficiency and enable faster transactions with less room for human error. Digitized trade information can reduce costs, as it streamlines operations and facilitates instant compliance checks against anti-money-laundering laws and international sanctions. Greater involvement from national governments and regional institutions can also help address the persistent, unmet demand for trade finance by strengthening support for export credit agencies and trade finance programs, developing the information and communication technology infrastructure, and harmonizing regulations for digital trade finance.

I hope this report will contribute to better understanding of trade facilitation issues in the region. The policy suggestions it offers can help overcome challenges and identify new opportunities to achieve greater inclusiveness in trade and development.

A handwritten signature in black ink, appearing to read 'Bambang Susantono', with a horizontal line underneath.

**Bambang Susantono**

Vice-President for Knowledge Management and Sustainable Development  
Asian Development Bank

# ACKNOWLEDGMENTS

---

This publication was jointly prepared by the Regional Cooperation and Integration Division (ERCI) of the Economic Research and Regional Cooperation Department (ERCD), the Asian Development Bank (ADB), and the Trade, Investment and Innovation Division (TIID) of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP).

Cyn-Young Park, Director of ERCI, ADB and Yann Duval, Chief of Trade Policy and Facilitation Section, TIID, ESCAP led the preparation of this publication.

Kijin Kim of ADB coordinated overall production assisted by Aleli Rosario, and contributed to the production of the theme chapter, “Bridging Trade Finance Gaps through Technology.” Background papers were provided by Alex Yang, Hsiao-Hui Lee, and Meghana Ayyagari. Additional inputs and consultations were provided by Alisa DiCaprio, Andy Sze, Daniel Hersson, Moon Gouk Chae, Nana Khurodze, Paul Heaney, Shigeaki Kamo, Steven Beck, Sung Su Kim, and Takuya Hoshino as well as from the participants in the ERCD-PSOD Joint Seminar on trade finance (Manila, April 2019) and the Regional Workshop on Trade Facilitation (Yerevan, June 2019). A group of consultants, namely, Benjamin A. Endriga, Ricardo III B. Ang, David Joseph Anabo, Joshua Anthony O. Gapay, and Zemma Ardaniel provided research support.

The main contributors from ESCAP included Yann Duval, Chorthip Utoktham, and Jiangyuan Fu, who provided the analysis of new data for countries in Asia and the Pacific, collected as part of the United Nations Global Survey on Digital and Sustainable Trade Facilitation 2019. Authors are grateful to Yuhua Zhang for her support in coordinating global survey data collection while at ESCAP, as well as to Maria-Teresa Pisani and Salehin Khan from the Economic Commission for Europe (UNECE) for supporting data collection in Central Asian countries. Anthonin Levelu provided research assistance and Guillaume Bertrand Healy gave editorial assistance.

Guy Sacerdoti and Eric Van Zant edited the manuscript. Achilleus Coronel created the cover design. Alvin Tubio did the layout and typesetting. Jess Macasaet proofread the material with assistance from Zemma Ardaniel, Benjamin A. Endriga, Carol Ongchangco, and Aleli Rosario. Support for printing and publishing this report was provided by the Printing Services Unit of ADB’s Office of Administrative Services and by the publishing team of the Department of Communications.

# ABBREVIATIONS

---

ADB	Asian Development Bank
AI	artificial intelligence
AML	anti-money-laundering
ASEAN	Association of Southeast Asian Nations
ECAs	export credit agencies
ESCAP	Economic and Social Commission for Asia and the Pacific
EU	European Union
fintech	financial technology
G20	Group of Twenty
ICC	International Chamber of Commerce
KSURE	Korea Trade Insurance Corporation
KYC	know-your-customer
LC	letter of credit
LDCs	least developed countries
LLDCs	landlocked developing countries
MDB	multilateral development bank
OECD	Organisation for Economic Co-operation and Development
PRC	People's Republic of China
SAARC	South Asian Association for Regional Cooperation
SMEs	small and medium-sized enterprises
TFA	Trade Facilitation Agreement
TFP	trade finance program
TIID	Trade, Investment and Innovation Division
UN	United Nations
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
WTO	World Trade Organization

# HIGHLIGHTS

---

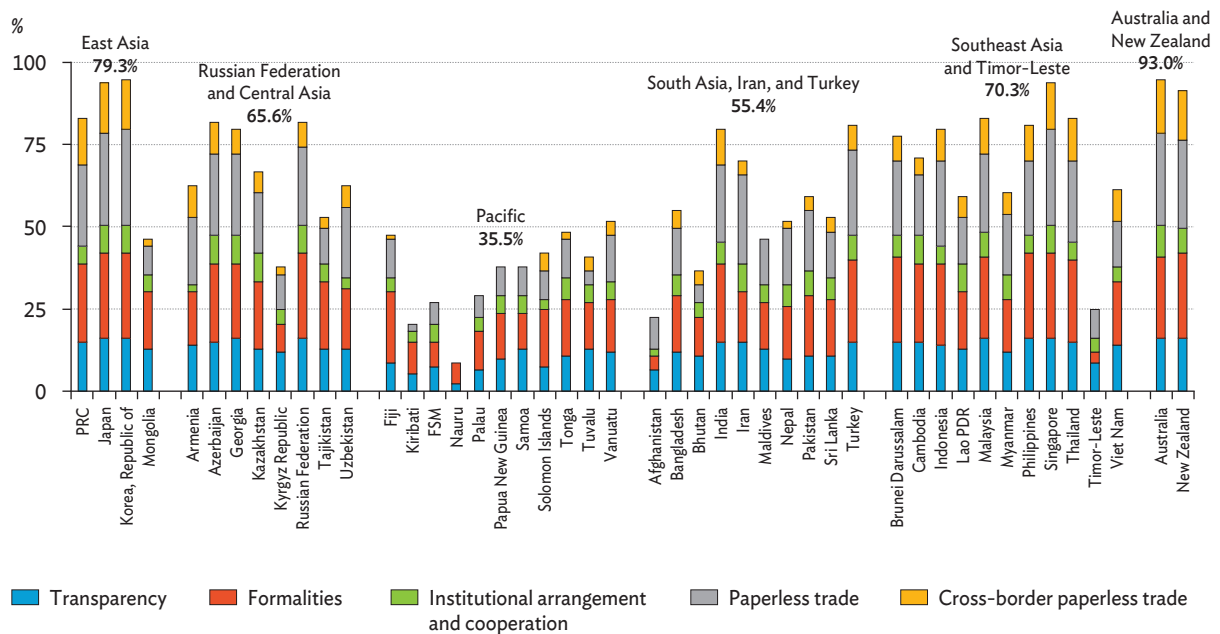
## ■ | Digital and Sustainable Trade Facilitation in Asia and the Pacific

**Trade costs in Asia and the Pacific remain high despite having declined modestly and vary widely across subregions.** The ESCAP-World Bank Trade Cost Database shows that the cost of trading goods is highest among the Pacific island developing economies, followed by the Russian Federation and Central Asia, and South Asian economies. Both Central Asia and the Pacific have, however, made progress in reducing trade costs with East and Southeast Asia. East Asia shows the lowest trade costs in the region, followed by the Association of Southeast Asian Nations (ASEAN) middle-income members.

**The 2019 Global Survey on Digital and Sustainable Trade Facilitation (formerly the Global Survey on Trade Facilitation and Paperless Trade Implementation) shows significant progress toward streamlining trade procedures in the region.**

- The average implementation rate of trade facilitation measures in Asia and the Pacific jumped by 10 percentage points between 2017 and 2019, to nearly 60%. The Russian Federation and Central Asian countries made the most progress, as implementation rates increased by more than 13% to 65.6% in 2019. The Pacific islands made the least progress.
- Implementation in 2019 varies by subregional group. After Australia and New Zealand, the highest average rate is found in East Asia (79.3%), followed by Southeast Asia and Timor-Leste (70.3%), the Russian Federation and Central Asia (65.6%), and South Asia, Iran, and Turkey (55.4%). The Pacific lags at 35.5%.
- Implementation also varies across groups of measures. Transparency measures, along with many of the general trade facilitation measures featured in the World Trade Organization Trade Facilitation Agreement (WTO TFA) are well implemented across the region, averaging implementation rates close to 80%. In contrast, cross-border paperless trade measures such as electronic exchange of certificates of origin or of sanitary or phytosanitary certificates have been initiated in less than 40% of the economies of the region, often only on a pilot basis.
- Measures targeted at agricultural trade facilitation have a regional average implementation rate of nearly 50%. However, low average implementation rates for small and medium-sized enterprises (SMEs, 36%) and women-owned firms (23%) show that very few countries have customized trade facilitation measures. Trade finance facilitation measures, such as the provision of trade finance through electronic single window systems, are found to have been considered by only a few countries, and rarely implemented.

### Overall Implementation of Trade Facilitation Measures in 46 Countries of Asia and the Pacific, 2019



FSM = Federated States of Micronesia, Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.

Notes: The Survey includes 53 trade facilitation measures, including many of the World Trade Organization Trade Facilitation Agreement (WTO TFA) measures related to enhancing “transparency,” “formalities,” and “institutional cooperation and arrangement” for trade facilitation, but also WTO TFA+ “paperless trade” and “cross-border paperless trade” measures related to the regional United Nations treaty on cross-border paperless trade facilitation adopted by United Nations Economic and Social Commission for Asia and the Pacific members in 2016. Sustainable trade facilitation measures aimed at facilitating trade in agriculture, as well as participation of small and medium-sized enterprises and women in trade are also included. In 2019, a new group of measures on “trade finance facilitation” was also pilot-tested. There were 46 countries in Asia and the Pacific included in the survey.

Source: ESCAP. 2019a. Digital and Sustainable Trade Facilitation Implementation in Asia and the Pacific: 2019 Update. *Trade Insights* No. 28. Bangkok.

**A simulation analysis demonstrates that implementation of trade facilitation measures that emphasizes trade digitalization, combined with improved maritime connectivity and access to credit issues, can reduce trade costs significantly.** Simulated implementation was tested for different packages of trade facilitation measures. Implementation of binding and non-binding WTO TFA measures reduces trade costs, on average, by 5% under a partial implementation scenario, and by 9% under the more ambitious full implementation scenario. Under a WTO TFA+ scenario where digital trade facilitation measures not specifically included in the WTO TFA are implemented, the average trade cost across countries declines by more than 16%. The simulations also show the importance of broader trade facilitation measures in reducing trade costs, including those aimed at improving maritime connectivity and access to finance.

**While continuous implementation of TFA-related measures is important, economies in Asia and the Pacific need to move gradually toward digital trade facilitation.** The 2019 Survey confirms that most countries in the region are engaged in implementing measures to improve transparency, enhance interagency coordination and cooperation, and streamline the fees and formalities associated with trade. However, implementation of bilateral and/or subregional paperless trade systems remains mostly at the pilot stage. The Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific, a United Nations treaty developed by more than 25 countries at different stages of development, provides the inclusive and flexible intergovernmental platform needed to accelerate progress, while leaving no one behind.

**Economies of the region should adopt more holistic and inclusive trade facilitation strategies, encompassing measures to facilitate logistics and finance processes, and catering to the needs of groups and sectors with special needs.** The 2019 Survey results highlighted the lack of trade facilitation programs and measures specifically targeted at SMEs and women-owned firms and, to a lesser extent, for the food and agriculture sector, all of which are key to sustainable and inclusive economic development in the region.

## ■ | Theme Chapter: Bridging Trade Finance Gaps through Technology

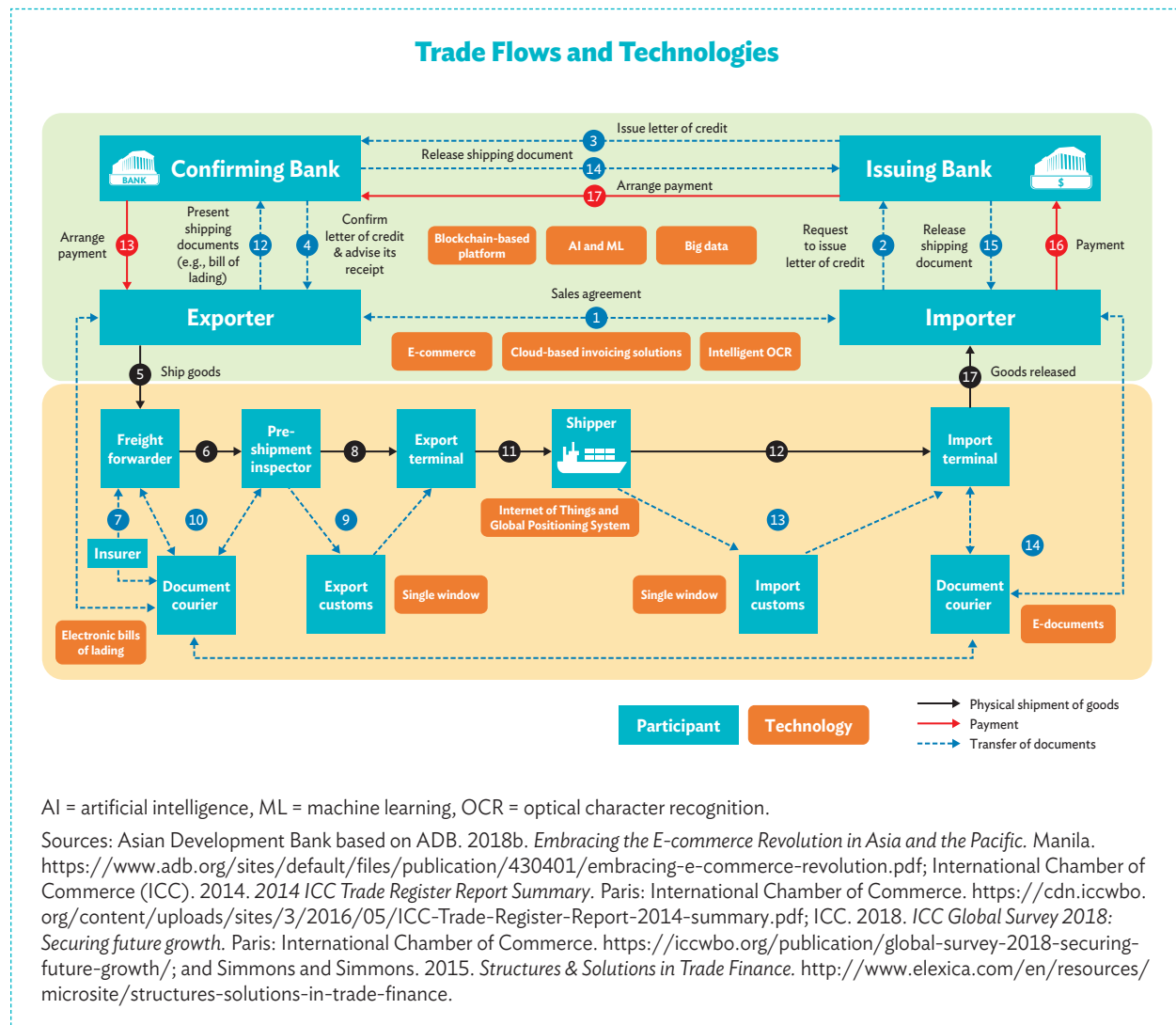
**Trade finance supports international trade and more inclusive growth.** International trade and policy reforms to lower barriers to trade are widely known to benefit inclusive growth. Access to trade finance allows businesses to fund operating costs and deal with various risks, whether commercial, exchange rate, transportation, or political. These risks are addressed through different instruments such as letters of credit, bank guarantees, and export credit insurance. While advanced economies typically have financial systems that provide widespread access to funding, developing economies find access to finance far more difficult—particularly for SMEs.

**Unmet demand for trade finance is persistently large.** An indicative measure of rejected trade finance applications shows a gap of about \$1.4 trillion–\$1.6 trillion, or around 8%–10% of world merchandise trade. Around half of global trade finance proposals originate from Asia and the Pacific, while 40% of rejected applications come from the region. SMEs are most affected as they tend to have higher rejection rates than larger firms. Banks have higher transaction and information costs when dealing with smaller companies, including anti-money-laundering/know-your-customer requirements and the low credit ratings of issuing banks and importers. High costs also make it unprofitable for small businesses to use trade finance instruments such as letters of credit.

**There are three main challenges in providing trade finance.** First, the continued use of paper means that documentary transactions in trade finance are prone to costly delays and errors. Letters of credit, for instance, may involve examination and validation of 10 to 20 documents involving more than 20 parties in information exchange and transmission. Second, financial institutions are required to conduct significant due diligence, which raises the cost of supplying trade financing. Third, while banks require knowledge of their clients to mitigate information asymmetry, this may pose significant hurdles in SMEs accessing finance.



Digitalization and automation may help address some long-standing issues in trade finance, such as high transaction processing costs and costly know-your-customer procedures. SMEs are usually burdened by high interest rates and collateral requirements, while banks are discouraged by the high cost of regulatory compliance. Technologies can help cut costs and facilitate transactions by eliminating manual documentation, and enable accumulated digital information on SME profiles for lenders to assess risk. E-commerce platforms and cloud-based invoicing, for example, allow direct transactions among smaller firms with reduced costs. Blockchain technology and artificial intelligence can facilitate due diligence and payments for SMEs that have difficulty in accessing bank credit. Such technologies utilize big data and alternate credit information that can enable more efficient know-your-customer compliance and due diligence. These technologies offer solutions that substantially improve efficiencies at various stages of international trade and therefore draw more SMEs into the system.



**Despite its rapid expansion, digitalization and fintech in trade finance still need to overcome major challenges.** Digitalization is far from complete; and implementation costs are one of its biggest issues. Blockchain technology is not entirely free of the risks related to transparency, cybersecurity, and operations, and can pose regulatory challenges. Fragmented digitalization can also create problems with digital implementation, making it difficult to be compatible and interoperable with other parties' systems.

## Policy Considerations

**Given the persistent, large unmet demand for trade finance, policy initiatives can promote and incentivize private-sector participation in trade finance.** This suggests greater public involvement, such as through export credit agencies (ECAs), is desirable. National ECAs may be able to support work that the private market finds unprofitable or excessively risky. The 2008/09 global financial crisis showed the private market could not assure adequate liquidity—and the work of ECAs along with international financial institutions significantly contributed to revitalizing global trade. Multilateral development banks can also contribute by providing guarantees and export credit. Government collaboration with private companies and with governments is critical to help spread technology adoption and enable cross-border trade financing.

**Governments and international institutions should develop digital infrastructure, harmonized standards, and regulations to encourage widespread technology adoption.** Developing a thriving fintech industry requires information and communication technology infrastructure and regulation. International coordination should focus on the interoperability of various systems to promote widespread technology adoption in the medium to long term. Three international initiatives can help create the basic infrastructure: (i) the Digital Standards for Trade initiative works to develop digital standards of the trade ecosystem and create a scorecard to benchmark industries toward digitalization; (ii) the Global Legal Entity Identifier system issues unique identifiers for large and small firms at low cost and helps to improve transparency on anti-money-laundering and know-your-customer concerns; and (iii) model laws on electronic transferable records, as well as electronic commerce and signatures, have been created under the United Nations system to help countries implement legislation for digital trade in a concerted fashion.

**Improved awareness of trade finance products, reinforced by government support programs, can help SMEs tap trade finance.** Directly engaging with SMEs and industry associations is critical to help develop export capability and enable exporters to develop more effective strategies that acknowledge the full cost of entering new markets. Another main area of focus should be on building more database on trade finance. The lack of a centralized database on trade finance necessitates initiatives to continue monitoring how much trade finance is provided, so that gaps can be identified and closed.

# DIGITAL AND SUSTAINABLE TRADE FACILITATION IN ASIA AND THE PACIFIC\*

International trade is included as an important *Means of Implementation* of the 2030 Agenda for Sustainable Development.<sup>1</sup> Trade facilitation, or making trade procedures more efficient to ensure that engaging in licit trade is easier and cheaper for all, has been acknowledged as one of the keys to ensuring that trade contributes to addressing the social, economic and environmental dimensions of sustainable development in a more balanced way.<sup>2</sup> In this context, this chapter reviews the most recent data available on trade costs and trade facilitation implementation in Asia and the Pacific. On that basis, it provides updated estimates of the impact of different packages of trade facilitation measures on trade costs of the region and outlines a way forward.

---

\* This section updates the 2017 assessment report done by ESCAP. See <https://www.adb.org/sites/default/files/publication/359786/trade-facilitation-connectivity.pdf>.

<sup>1</sup> The Agenda was adopted by all member countries of the United Nations in 2015. The agenda includes 17 Sustainable Development Goals. See, <https://www.un.org/sustainabledevelopment/development-agenda/>.

<sup>2</sup> See, among others, WTO (2015) and ESCAP (2017).

## 1

# Trade Costs and Trade Facilitation in Asia and the Pacific: State of Play<sup>3</sup>

## 1.1 | Trade Costs: Subregional Trends

The European Union (EU) is generally considered the most integrated country bloc in the world. Latest data from the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)-World Bank Trade Cost Database show that the overall cost of trading goods among the three largest EU economies is equivalent to a 42% average tariff on the value of goods traded (Table 1). In contrast, the People's Republic of China (PRC), Japan, and the Republic of Korea (East Asia-3) come closest to matching intra-EU trade costs (a 55% tariff equivalent), followed by the middle-income Association of Southeast Asian Nations (ASEAN) members (76%). On the other hand, the highest intraregional trade cost are in the Pacific Island developing economies (133%) and the South Asian Association for Regional Cooperation (SAARC) (121%).

The evolution of trade costs in Asia and the Pacific subregions with the three largest developed economies—Germany, Japan, and the United States—from 1996 to 2016 can be found in Figure 1. Trade costs in Asia and the Pacific still show significant disparities between different subregions, although the cost levels themselves have been slowly declining over time. The lowest trade costs are in East Asia-3, while the highest are in Pacific island developing economies, followed by the Russian Federation and Central Asia and the SAARC-4.

---

<sup>3</sup> Regional groupings used here are defined as follows: East Asia includes the People's Republic of China, Japan, the Republic of Korea, and Mongolia; Central Asia includes Armenia, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Tajikistan, and Uzbekistan; the Pacific includes Fiji, Kiribati, the Federated States of Micronesia, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu; South Asia includes Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka; Southeast Asia includes Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic (Lao PDR), Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam; landlocked developing countries include Afghanistan, Armenia, Azerbaijan, Bhutan, Kazakhstan, the Kyrgyz Republic, the Lao PDR, Mongolia, Nepal, Tajikistan, and Uzbekistan; least developed countries include Afghanistan, Bangladesh, Bhutan, Cambodia, Kiribati, the Lao PDR, Myanmar, Nepal, Solomon Islands, Timor-Leste, Tuvalu, and Vanuatu; small island developing states include Fiji, Kiribati, Maldives, the Federated States of Micronesia, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu.

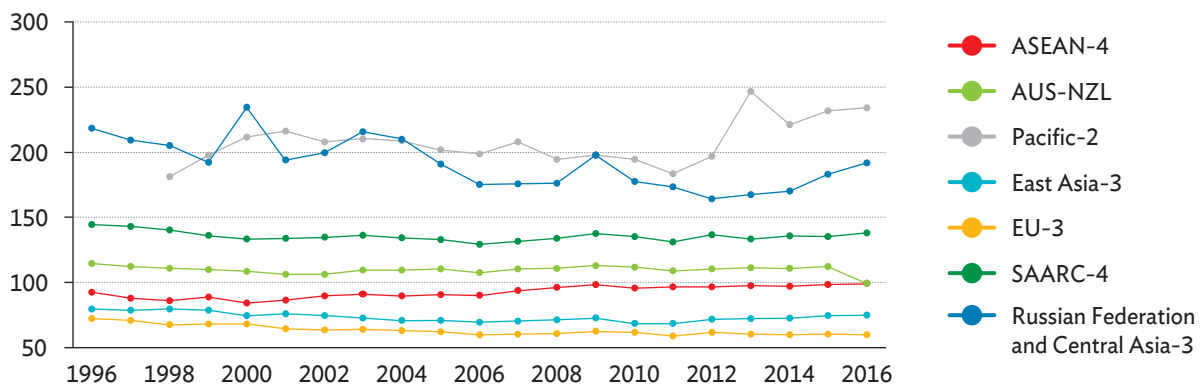
**Table 1: Intraregional and Extra-Regional Comprehensive Trade Costs in Asia and the Pacific, 2012–2017 (excluding tariff costs)**

Region	ASEAN-4	East Asia-3	Russian Fed. and Central Asia-3	Pacific-2	SAARC-4	AUS-NZL	EU-3
ASEAN-4	76.1% (1.3%)						
East Asia-3	78.3% (6.0%)	55.0% (7.6%)					
Russian Federation and Central Asia-3	334.1% (-7.8%)	168.6% (-4.5%)	113.1% (-7.3%)				
Pacific-2	168.5% (-7.9%)	162.6% (-6.6%)	378.2% (21.5%)	133.3% (-0.5%)			
SAARC-4	132.8% (5.1%)	124.2% (-0.6%)	304.9% (7.0%)	253.2% (-19.4%)	121.3% (10.3%)		
AUS-NZL	102.6% (3.6%)	87.8% (-2.2%)	373.0% (5.5%)	88.6% (4.2%)	137.2% (-4.5%)	55.5% (3.0%)	
EU-3	104.5% (-4.1%)	85.6% (0.8%)	149.9% (-3.8%)	197.2% (-7.3%)	114.3% (0.2%)	107.5% (-2.0%)	42.1% (-5.6%)
United States	87.6% (6.7%)	65.2% (5.6%)	181.2% (0.8%)	164.0% (-0.6%)	114.7% (7.1%)	101.1% (2.0%)	67.5% (2.3%)

ASEAN-4: Indonesia, Malaysia, Philippines, Thailand; East Asia-3: People's Republic of China, Japan, Republic of Korea; Central Asia-3: Georgia, Kazakhstan, Kyrgyz Republic; Pacific-2: Fiji, Papua New Guinea; SAARC-4: Bangladesh, India, Pakistan, Sri Lanka; AUS-NZL: Australia, New Zealand; and EU-3: Germany, France, United Kingdom.

Note: Trade costs may be interpreted as tariff equivalents. Percentage changes in trade costs between 2006–2011 and 2012–2017 are in parentheses.

Sources: ESCAP-World Bank Trade Cost Database, <https://artnet.unescap.org/databases#tradedcost> and <https://www.unescap.org/resources/escap-world-bank-trade-cost-database> (accessed July 2019).

**Figure 1: Trade Costs of Asia and Pacific Subregions with Large Developed Economies, 1996–2016**

ASEAN-4: Indonesia, Malaysia, the Philippines, and Thailand; AUS-NZL: Australia and New Zealand; Central Asia-3: Georgia, Kazakhstan, and the Kyrgyz Republic; East Asia-3: the People's Republic of China, Japan, and the Republic of Korea; EU-3: Germany, France, and the United Kingdom; Pacific-2: Fiji and Papua New Guinea; and SAARC-4: Bangladesh, India, Pakistan, and Sri Lanka.

Note: Trade costs shown are tariff equivalents, calculated as trade-weighted average trade costs of countries in each subregion with the three largest developed economies (Germany, Japan, and the United States).

Sources: ESCAP-World Bank Trade Cost Database, <https://artnet.unescap.org/databases#tradedcost>, and <https://www.unescap.org/resources/escap-world-bank-trade-cost-database> (accessed July 2019).

## 1.2 | Implementation of Digital and Sustainable Trade Facilitation Measures

### 1.2.1 Status of implementation

The regional state of implementation of trade facilitation presented here is based on the results of the third United Nations Global Survey on Digital and Sustainable Trade Facilitation conducted between January 2019 and July 2019. The first regional survey on the implementation of trade facilitation and paperless trade was conducted in 2012 by the ESCAP Secretariat during the 4th Asia-Pacific Trade Facilitation Forum organized by ESCAP and the Asian Development Bank (ADB). Building on this regional effort, the first and second global surveys were conducted by all United Nations Regional Commissions in 2015, and other international organizations in 2017. The creation of this survey answered the need for reliable, detailed, and regularly updated data on the implementation of both traditional and more forward-looking trade facilitation measures, now available at <https://untfsurvey.org>.

The 2019 Survey includes 53 trade facilitation measures—categorized into four groups and 11 subgroups—as shown in Table 2. The first group of “general trade facilitation measures” includes many of the WTO Trade Facilitation Agreement (WTO TFA; Box 1) measures under four subgroups: “transparency,” “formalities,” “institutional cooperation and arrangement,” and “transit facilitation.” The second group of “digital trade facilitation” measures relate to the regional UN treaty on cross-border paperless trade facilitation adopted by ESCAP members in 2016 (Box 2) and includes two subgroups: “paperless trade” and “cross-border paperless trade,” many of them WTO TFA+ measures. The third group of “sustainable trade facilitation measures” includes three subgroups: “trade facilitation for small and medium-sized enterprises” (SMEs), “agricultural trade facilitation,” and “women in trade facilitation.” In 2019, a fourth and new group on “trade finance facilitation” was also pilot tested.<sup>4</sup>

For analysis and presentation purposes, each trade facilitation measure included in the survey is rated either as “fully implemented,” “partially implemented,” “on a pilot basis,” or “not implemented.” A score (weight) of 3, 2, 1, and 0 was assigned each implementation stage to calculate scores for individual measures across countries, regions, or categories.<sup>5</sup>

Implementation rates of an ambitious set of 31 general and digital trade facilitation measures included in the survey were calculated for 46 countries in Asia and the Pacific (Figure 2).<sup>6</sup> The regional average implementation rate for 2019 is 59.7%, but results vary widely by country and subregion.

<sup>4</sup> Developed in cooperation with the International Chamber of Commerce (ICC) Banking Commission.

<sup>5</sup> For methodological details and a more extensive analysis of results, please refer to ESCAP Digital and Sustainable Trade Facilitation Report: Asia-Pacific 2019, forthcoming at <https://untfsurvey.org/>.

<sup>6</sup> Among 38 general and digital trade facilitation measures surveyed, three—including numbers 20. *Electronic Submission of Sea Cargo Manifests*; 33. *Alignment of working days and hours with neighboring countries at border crossings*; and 34. *Alignment of formalities and procedures with neighboring countries at border crossings*—are excluded for calculating the overall score as they do not apply to all countries surveyed. Similarly, four transit facilitation measures are also excluded. The overall score of each country is simply the sum of the implementation scores (3, 2, 1, or 0) for each trade facilitation measure. The maximum possible score is 93 and the average score across all 46 countries is 55.5 (or 59.7% in percentage terms).

**Table 2: Trade Facilitation Measures in the Global Survey on Digital and Sustainable Trade Facilitation**

Grouping		Question Number	Trade Facilitation Measure in the Questionnaire	Related TFA Articles
General Trade Facilitation Measures	Transparency (5 measures)	2	Publication of existing import-export regulations on the internet	1.2
		3	Stakeholder consultation on new draft regulations (prior to their finalization)	2.2
		4	Advance publication/notification of new regulations before their implementation (e.g., 30 days prior)	2.1
		5	Advance ruling (on tariff classification)	3
		9	Independent appeal mechanism (for traders to appeal customs rulings and the rulings of other relevant trade control agencies)	4
	Formalities (8 measures)	6	Risk management (as a basis for deciding whether a shipment will be physically inspected or not)	7.4
		7	Pre-arrival processing	7.1
		8	Pre-arrival processing	7.5
		10	Post-clearance audit	7.3
		11	Separation of release from final determination of customs duties, taxes, fees, and charges	7.6
		12	Establishment and publication of average release times	7.7
		13	Expedited shipments	7.8
		14	Acceptance of paper or electronic copies of supporting documents required for import, export or transit formalities	10.2.1
	Institutional cooperation and arrangement (5 measures)	1	Establishment of a national trade facilitation committee or similar body	23
		31	Cooperation between agencies on the ground at the national level	8
		32	Government agencies delegating controls to customs authorities	
		33	Alignment of working days and hours with neighboring countries at border crossings	8.2(a)
		34	Alignment of formalities and procedures with neighboring countries at border crossings	8.2(b)
	Transit facilitation (4 measures)	35	Transit facilitation agreement(s) with neighboring country(ies)	
		36	Customs authorities limit the physical inspection of transit goods and use risk assessment	10.5
37		Supporting pre-arrival processing for transit facilitation	11.9	
38		Cooperation between agencies of countries involved in transit	11.16	
Digital Trade Facilitation Measures	Paperless trade (10 measures)	15	Electronic/automated Customs System established (e.g., Automated System for Customs Data)	
		16	Internet connection available to customs and other trade control agencies at border crossings	
		17	Electronic Single Window System	10.4
		18	Electronic submission of customs declarations	
		19	Electronic application and issuance of Import and Export Permit	
		20	Electronic submission of sea cargo manifests	
		21	Electronic submission of air cargo manifests	
		22	Electronic application and issuance of Preferential Certificate of Origin	
		23	E-payment of customs duties and fees	7.2
		24	Electronic application for customs refunds	

continued next page

**Table 2: Continued**

Grouping		Question Number	Trade Facilitation Measure in the Questionnaire	Related TFA Articles
Digital Trade Facilitation Measures	Cross-border paperless trade (6 measures)	25	Laws and regulations for electronic transactions are in place (e.g., e-commerce law, e-transaction law)	
		26	Recognized certification authority issuing digital certificates to traders to conduct electronic transactions	
		27	Customs declaration electronically exchanged between your country and other countries	
		28	Certificate of origin electronically exchanged between your country and other countries	
		29	Sanitary and phytosanitary certificate electronically exchanged between your country and other countries	
		30	Banks and insurers in your country retrieving letters of credit electronically without lodging paper-based documents	
Sustainable Trade Facilitation	Trade facilitation for SMEs (5 measures)	39	Government has developed trade facilitation measures that ensure easy and affordable access for small and medium-sized enterprises (SMEs) to trade-related information	7.9
		40	Government has developed specific measures that enable SMEs to more easily benefit from the Authorized Economic Operator scheme	
		41	Government has taken actions to make single windows more easily accessible to SMEs (e.g., by providing technical consultation and training services to SMEs on registering and using the facility)	
		42	Government has taken actions to ensure that SMEs are well represented and made key members of National Trade Facilitation Committees	
		43	Implementation of other special measures to reduce costs for SMEs	
	Agricultural trade facilitation (4 measures)	44	Testing and laboratory facilities are equipped for compliance with sanitary and phytosanitary (SPS) standards in your main trading partners	
		45	National standards and accreditation bodies are established for the purpose of compliance with SPS standards	
		46	Application, verification, and issuance of SPS certificates is automated	
		47	Special treatment given to perishable goods at border crossings	
	Women in trade facilitation (3 measures)	48	The existing trade facilitation policy/strategy incorporates special consideration of women involved in trade	
		49	Government has introduced trade facilitation measures aimed at women involved in trade	
		50	Female membership in the National Trade Facilitation Committee	
	Trade finance facilitation (3 measures)	51	Single window facilitates traders with access to finance	
52		Banks allow electronic exchange of data between trading partners or with banks in other countries to reduce dependence on paper documentation and advance digital trade		
53		A variety of trade finance services available		

TFA = Trade Facilitation Agreement.

Source: ESCAP (2019a).



### **Box 1: Implementation of the World Trade Organization Trade Facilitation Agreement in Asia and the Pacific: 2 years on**

The World Trade Organization (WTO) Trade Facilitation Agreement (TFA) came into force on 22 February 2017 upon ratification by two-thirds of WTO members. As of 1 August 2019, 34 economies in Asia and the Pacific have ratified the agreement. Tajikistan most recently presented its instrument of ratification (on 2 July 2019), meaning that now only four WTO members in the region have yet to ratify—three of them Pacific island economies.

Official notifications submitted to the WTO by countries in Asia and the Pacific reveal that significant progress has been made by the region's developing economies in implementing the agreement. Sixty-five percent of the WTO TFA has been implemented in the region, a 6-percentage point increase from 2017. Based on the date of implementation provided by countries in their notifications, an additional 11.1% of measures should be implemented by 22 February 2024, bringing the regional TFA implementation average above 76%.

While the significant progress made over the past 2 years deserves to be highlighted, full completion of the TFA is far from being achieved. The implementation rate in least developed countries (LDCs)—based on notifications submitted—is below 30%. This emphasizes the need for the development community to continue providing required technical assistance and capacity building, especially to LDCs.

Overall, WTO TFA notifications provide a useful (albeit imperfect) snapshot of the progress and efforts made by WTO members in Asia and the Pacific in implementing the agreement and related trade facilitation measures. Complementary implementation monitoring mechanisms, such as the United Nations Global Survey on Digital and Sustainable Trade Facilitation, and strengthened reporting (transparency notification) requirements to the WTO Trade Facilitation Committee are needed to get a clearer picture of the extent trade facilitation measures are being implemented on the ground.

Source: ESCAP (2019b).

### **Box 2: Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific: An Update**

The Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific was adopted by the Economic and Social Commission for Asia and the Pacific (ESCAP) members in 2016.<sup>a</sup> This newest United Nations treaty in trade and development aims to facilitate implementation of trade digitalization and provide a dedicated intergovernmental framework to develop harmonized solutions for the electronic exchange and legal recognition of trade data and documents across borders.

Armenia, Bangladesh, Cambodia, the People's Republic of China, and Iran signed in 2017. Azerbaijan acceded to the treaty in 2018 and another 20 countries are completing domestic procedures to accede, according to the most recent intergovernmental steering group meeting held in March 2019.

<sup>a</sup> Full text available at [https://treaties.un.org/doc/source/docs/ESCAP\\_RES\\_72\\_4-E.pdf](https://treaties.un.org/doc/source/docs/ESCAP_RES_72_4-E.pdf).

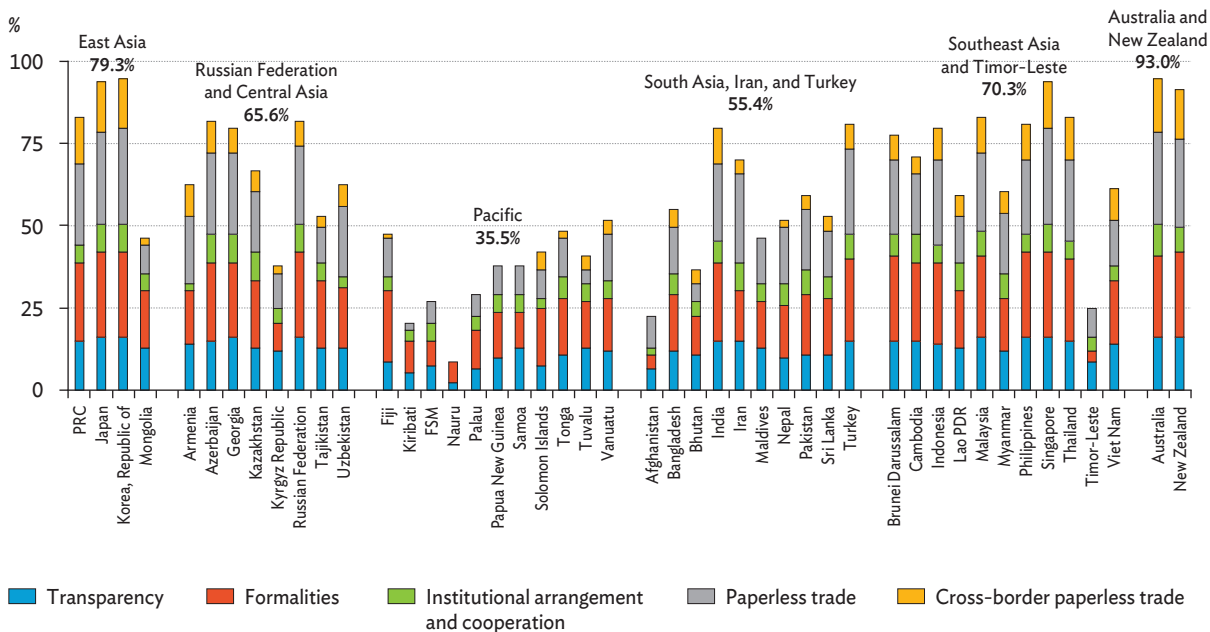
**Box 2: Continued**

The treaty will enter into force after five members have ratified or acceded to it. Entirely dedicated to facilitation of cross-border paperless trade, the agreement complements the World Trade Organization Trade Facilitation Agreement (WTO TFA), which focuses on conventional trade facilitation measures but does not specifically feature paperless trade. Implementing the framework agreement is expected to help ESCAP members meet the single-window commitments of the WTO TFA, among others.

Benefits from the framework agreement are numerous. First, it enables countries that become party to establish leadership and set a clear strategic direction at national and international levels toward the digitalization of trade procedures, while retaining full flexibility in terms of the scope and speed of reforms. Second, it provides parties a unique platform to develop harmonized and coordinated solutions for single-window and other paperless trade systems interoperability, including through pilot projects and capacity building. Ultimately, it is expected to allow substantial efficiency gains thanks to the electronic exchange of data and documents, with transaction cost savings estimated at up to 25% of overall trade costs.

Source: ESCAP database. <http://www.unescap.org/resources/framework-agreement-facilitation-cross-border-paperless-trade-asia-andpacific> (accessed 15 July 2019).

**Figure 2: Overall Implementation of Trade Facilitation Measures (46 Asia and Pacific Countries)**

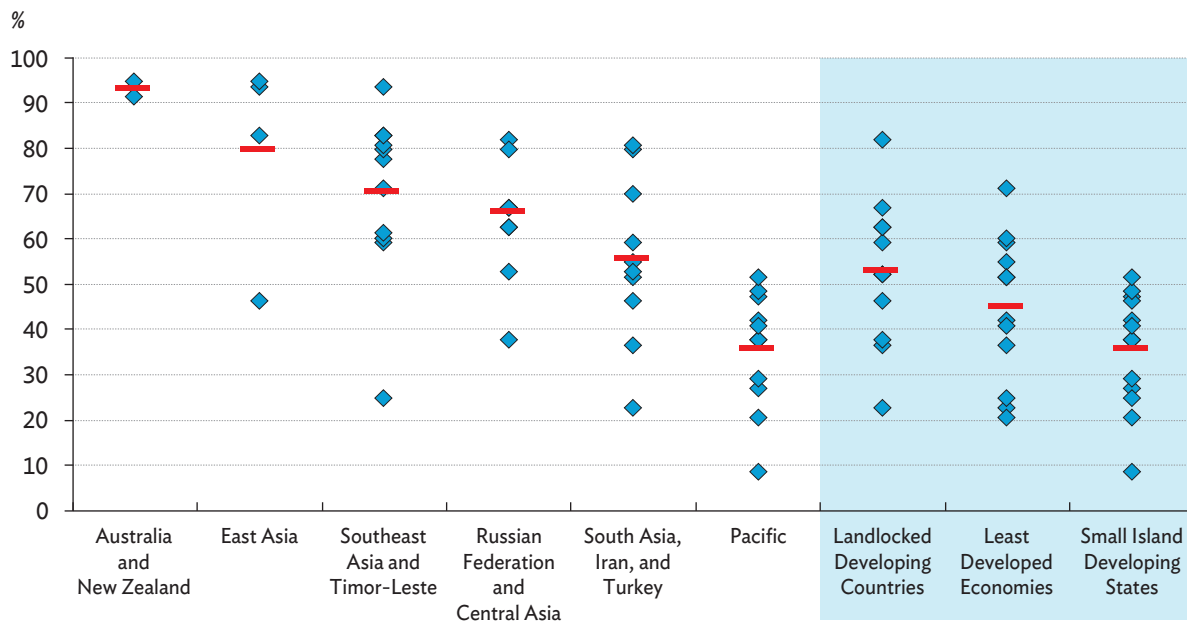


FSM = Federated States of Micronesia, Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.  
Source: ESCAP (2019a).

Developed economies of the region (Australia, Japan, New Zealand), as well as Singapore and the Republic of Korea, all have implementation rates of at least 90%. In contrast, implementation in several Pacific island countries stands below 30%.

Trade facilitation implementation rates by subregion and groups of countries with special needs—least developed countries (LDCs), landlocked developing countries (LLDCs), and small island developing states (SIDS)—are shown in Figure 3. After Australia and New Zealand, the highest average rates were in East Asia (79.3%), Southeast Asia and Timor-Leste (70.3%), the Russian Federation and Central Asia (65.6%), and South Asia, Iran, and Turkey (55.4%). The Pacific lags at 35.5%.

**Figure 3: Trade Facilitation Implementation across Asia and Pacific Subregions and Countries with Special Needs**



Note: Blue diamonds represent country scores; red lines are group averages.

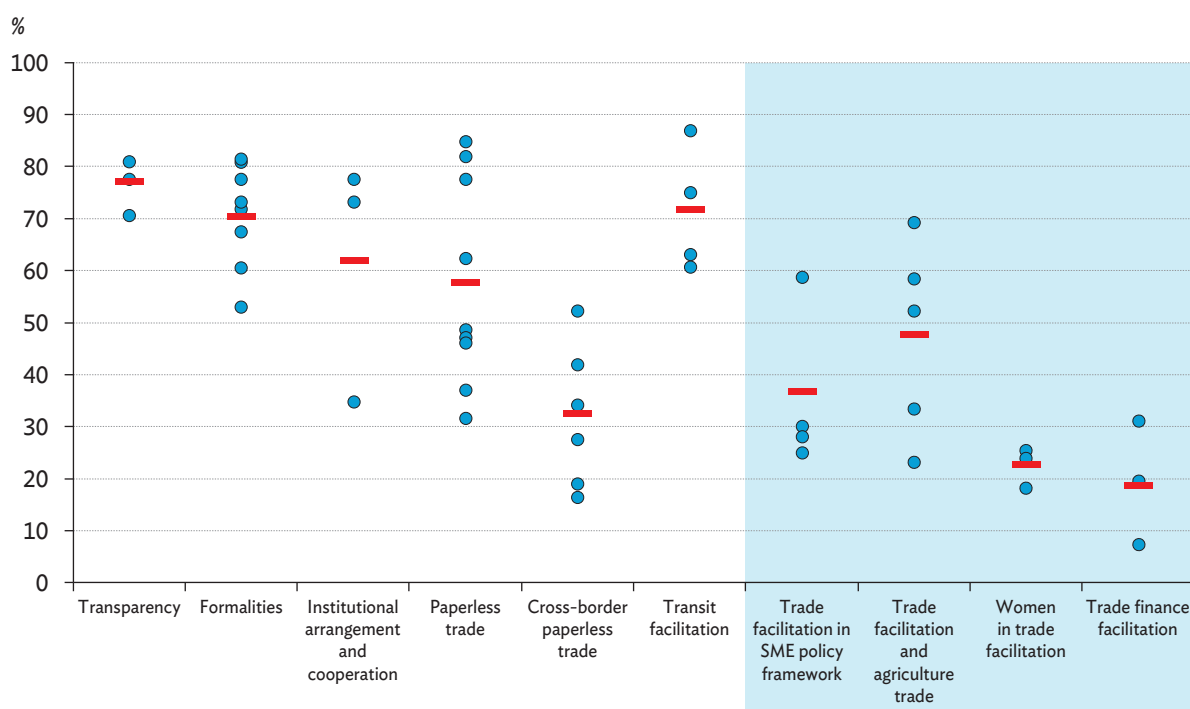
Source: ESCAP (2019a).

Wide disparities in implementation rates exist within each subregional group. Differences in trade facilitation implementation levels are most pronounced in Southeast Asia, but only because the group includes Timor-Leste, a country that is not yet a member of ASEAN. Indeed, the ASEAN regional integration processes appear to have played a significant and positive role in trade facilitation implementation. Differences in trade facilitation implementation levels are less pronounced among the small Pacific islands. This may be explained by the fact that these small islands are generally isolated economies and face similar implementation constraints.

Countries with special needs face difficulties in implementing trade facilitation measures. The average implementation level of these countries varies between 8.6% (Nauru) and 81.7% (Azerbaijan), depending on the group considered. Interestingly, LLDCs as a group have reached higher levels of trade facilitation compared to LDCs and SIDSs. This may be explained by the particular importance attached to trade (and transit) facilitation by these economies, as reflected in the Vienna Programme of Action.<sup>7</sup>

Figure 4 displays the implementation levels of different groups of measures. General trade facilitation measures included in the WTO TFA are widely implemented: Measures related to “transparency” have been the best implemented (regional average implementation at 77%). Implementation of measures to streamline trade “formalities” and for “transit facilitation” also exceed 70%. Regional average implementation exceeds 60% for measures related to “institutional arrangements and inter-agency cooperation.” This is generally in line with category A notifications sent by countries to the WTO in the context of the TFA.

**Figure 4: Implementation of Groups of Trade Facilitation Measures**



Note: Blue dots represent country scores; red lines are group averages.

Source: ESCAP (2019a).

<sup>7</sup> For more information see <http://unohrlls.org/about-lldc/programme-of-action/>.

As for digital trade facilitation measures, the regional average level of implementation of “paperless trade,” which includes measures such as single window and e-payment of customs duties, is now close to 55%. However, despite the fact that the legal framework to enable paperless trade has improved in many economies, the average rate of implementation of “cross-border paperless trade” is currently 32%. Many developing countries have yet to initiate implementation of measures in this group.

In an effort to mainstream the Sustainable Development Goals into trade facilitation, sustainable trade facilitation measures—trade facilitation for SMEs, for agriculture, and for women engagement in trade—were added to the survey beginning 2017. Figure 4 shows that agricultural trade facilitation measures have been relatively well implemented, with an implementation rate of close to 50%. However, implementation rates for small and medium-sized enterprises (37%) and women-owned firms (23%) show that very few countries have developed trade facilitation measures that cater to their specific needs.

Trade finance facilitation measures were added to the 2019 Survey on a trial basis, given their importance as trade enablers. The implementation rate observed for trade finance facilitation measures is lowest (19%), although this is in large part due to the fact that no information could be obtained on these measures in about half the countries surveyed—considering only countries for which data could be collected and validated, the regional implementation rate for the region rises to about 35%. The high rates of “Don’t know” also show that trade facilitation experts and officials that provided or validated the survey are unfamiliar with trade finance. Traditional trade facilitation actors, including customs and ministries in charge of trade, may see procedures related to financing and payment of international trade transactions as outside their scope of work. Given the interdependence between goods and financial flows, however, the results suggest a need for far better coordination and cooperation between them and those involved in developing financial and payment services.

The most and least implemented measures within each category of trade facilitation measures are shown in Table 3. The most implemented “transparency” measure in the region is *Publication of existing import-export regulations on the internet* and *Stakeholders’ consultation on new draft regulations (prior to their finalization)*: More than 95% of the 46 economies have implemented them at least on a pilot basis. In contrast, *Advance ruling on tariff classification* and *origin of imported goods* are least implemented in this category. Nonetheless, it has been already fully implemented in 45.7% of countries in the region—and implemented at least on a pilot basis by 89% of the countries (i.e., 41 countries).

*Risk management*, the most implemented among “formalities” measures, has been implemented at least on a pilot basis by 98% of the countries surveyed. However, it has been fully implemented by less than 50%. Almost a quarter of countries in the region have not initiated *establishment and publication of average release times*, with 36 countries considered to be still at least on the pilot stage. However, it is encouraging that a significant number of countries have conducted *time release studies* on a pilot basis.

Among “institutional and cooperation” measures, *national legislative framework and/or institutional arrangements for border agencies cooperation* are implemented at least on a pilot basis in 96% of the countries. *National Trade Facilitation Committees or similar bodies* have also been established in most countries, in part because it is mandatory under the WTO TFA. In contrast, implementation levels of mechanisms enabling *government agencies delegating controls to customs authorities* remain well below 50% in Asia and the Pacific.

**Table 3: Most and Least Implemented Measures in Asia and the Pacific**  
(within each trade facilitation measure group)

Category	Most implemented (% of countries)		Least implemented (% of countries)	
	Measure	Implemented fully, partially and on a pilot basis (%) / Full implementation (%)	Measure	Implemented fully, partially and on a pilot basis (%) / Full implementation (%)
<b>Transparency</b>	Publication of existing import-export regulations on the internet Stakeholders' consultation on new draft regulations (prior to their finalization)	95.7/50.0	Advance ruling on tariff classification and origin of imported goods	89.1/45.7
<b>Formalities</b>	Risk management	97.8/43.5	Trade facilitation measures for authorized operators	76.1/28.3
<b>Institutional arrangement and cooperation</b>	National legislative framework and/or institutional arrangements for border agencies cooperation	95.7/32.6	Government agencies delegating controls to Customs authorities	45.7/17.4
<b>Paperless trade</b>	Automated Customs System	95.7/63.0	Electronic Application for Customs Refunds	37.0/19.6
<b>Cross-border paperless trade</b>	Laws and regulations for electronic transactions	73.9/15.2	Paperless collection of payment from a documentary letter of credit	26.1/4.3
<b>Transit facilitation</b>	Customs Authorities limit the physical inspections of transit goods and use risk assessment	58.7/41.3	Supporting pre-arrival processing for transit facilitation	47.8/21.7
<b>Trade facilitation in SME policy framework</b>	Trade-related information measures for SMEs	78.3/30.4	Other special measures for SMEs	37.0/6.5
<b>Trade facilitation and agriculture trade</b>	Special treatment for perishable goods	84.8/45.7	Electronic application and issuance of SPS certificates	47.8/10.9
<b>Women in trade facilitation</b>	Trade facilitation measures aimed at female traders	45.7/2.2	Female membership in the National Trade Facilitation Committee	23.9/6.5
<b>Trade finance facilitation</b>	Variety of trade finance services available	50.0/4.3	Single window facilitates traders to access to finance	8.7/4.3

SMEs = small and medium-sized enterprises, SPS = sanitary and phytosanitary.

Source: ESCAP (2019a).

This is particularly so in Pacific island developing economies and the Russian Federation and Central Asia, where implementation is also below 50%.

Among nine trade facilitation measures categorized as “paperless trade” measures, *automated customs system* is the most implemented of those included in the survey. In contrast, regional implementation of almost all other measures, including *electronic application for customs refunds* and *electronic application and issuance of preferential certificates of origin* are well below the overall regional implementation average. Implementation of “paperless trade” measures in Southeast Asia and Timor-Leste and East Asia exceed those of other subregions, especially for *electronic single window system*, *electronic application and issuance of import and export permit* and *electronic submission of air cargo manifests* (particularly in East Asia).

For the group of “cross-border paperless trade” measures, more than 70% of countries surveyed have at least partially developed the legal and regulatory frameworks needed to support electronic transactions—but these frameworks remain incomplete and may not readily support the legal recognition of electronic data or documents received from stakeholders in other countries. Partially as a result of the lack of institutional and legal frameworks to support cross-border paperless trade, *paperless collection of payment from a documentary letter of credit* has remained limited, slightly greater than 25% (only 12 countries are at least piloting the measure). Indeed, *electronic exchange of sanitary and phytosanitary certificate* has been implemented on a limited basis by less than 40% of the economies of the region. Similarly, in all but one of the countries surveyed, it is not yet feasible for traders to apply for letters of credit electronically from banks or insurers without paper-based documents.

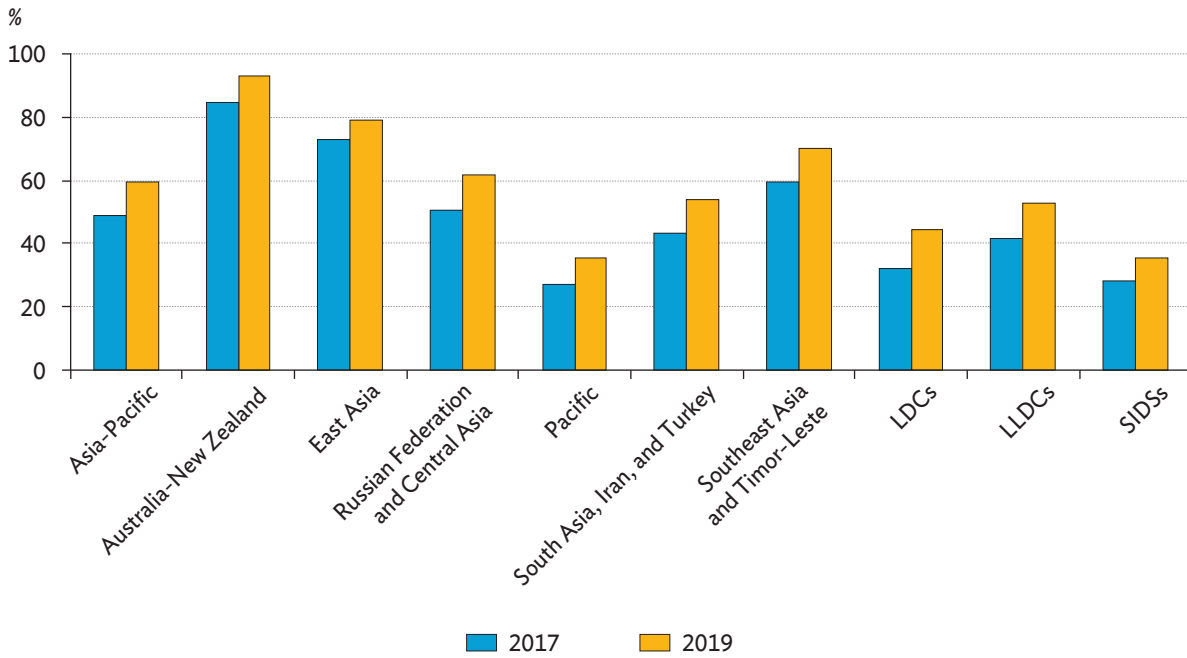
### 1.2.2 Progress in implementation from 2017 to 2019

A comparison between the second and third survey results shows substantial progress in Asia and the Pacific during 2017–2019 (Figure 5).<sup>8</sup> Overall average implementation in the region increased from 49% in 2017 to 59% in 2019. The figure also shows progress across different subregions, LLDCs, LDCs, and Pacific island countries. The Russian Federation and Central Asian countries made the most progress, with implementation increasing by more than 13 percentage points from 50.1% in 2017 to 63.6% in 2019—most countries in this group are also LLDCs. In contrast, the Pacific developing countries improved less substantially; implementation increased by 8.3 percentage points from 27.2% in 2017 to 35.5% in 2019.

Figure 6 shows that countries in Asia and the Pacific advanced implementation of general trade facilitation measures by the WTO TFA—transparency (9.5 percentage points), formalities (12.5 percentage points), and institutional arrangement and cooperation (7.6 percentage points). Implementation of digital trade facilitation measures also progressed well, as countries relied on computerization to facilitate implementation of many general measures. Implementation of “paperless trade” and “cross-border paperless” increased by more than 9 percentage points since 2017. The similar rates of change observed across groups suggest that general and digital measures are very much interrelated when it comes to implementation.

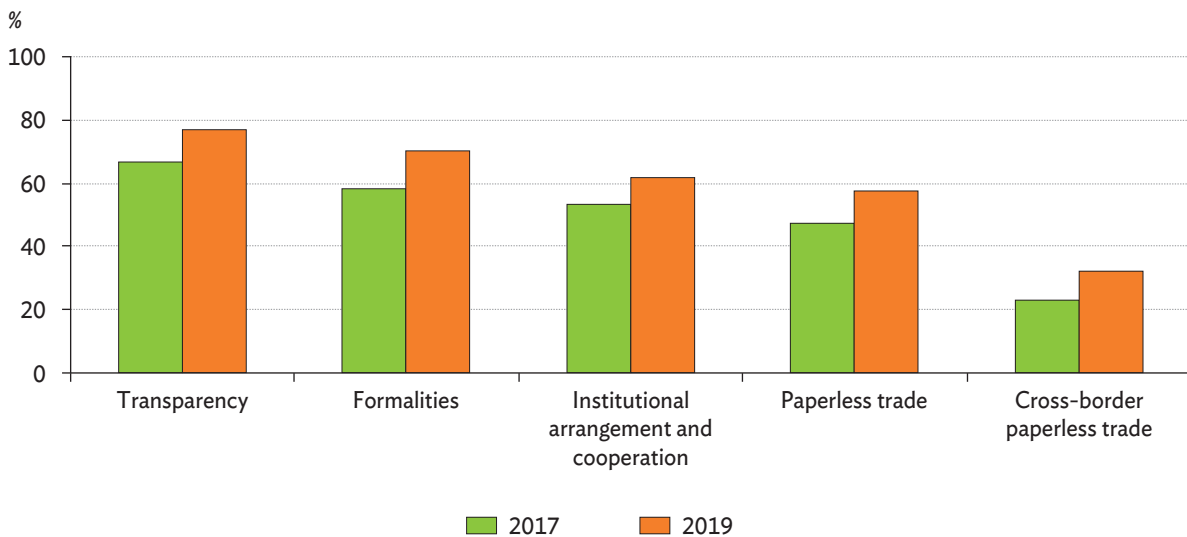
<sup>8</sup> The survey data for 2017 are not available for Georgia and Iran. Therefore, in this section, only 44 countries are used to calculate and compare regional and subregional implementation rates between 2017 and 2019.

**Figure 5: Trade Facilitation Implementation, 2017–2019**



LDCs = least developed countries, LLDCs = landlocked developing countries, SIDSs = small island developing states.  
 Source: ESCAP (2019a).

**Figure 6: Implementation of Groups of Trade Facilitation Measures, 2017–2019**



Source: ESCAP (2019a).



## 2

# Impact of Trade Facilitation on Trade Costs

To investigate the effect trade facilitation has on trade costs across countries, a trade cost model is used to estimate changes in the cost of trade that would result from improving trade facilitation in the region, including access to trade finance.

## 2.1 | Model and Data

Following Arvis et al. (2016), overall trade costs can be modelled as a function of natural geographic factors (distance, “landlockedness,” and contiguity), cultural and historical distance (common official language, common unofficial language, former colonial relationships, and formerly same country), and the presence of regional trade agreements and liner shipping connectivity index (LSCI). In addition, trade costs are also thought to be a function of trade facilitation implementation, as well as access to trade finance. Accordingly, the trade cost model is specified as

$$\begin{aligned} \ln(\tau_{ij}) = & \beta_0 + \beta_1 \ln(\text{gtariff}_{ij}) + \beta_2 \ln(\text{dist}_{ij}) + \beta_3 (\text{contig}_{ij}) + \beta_4 (\text{comlang\_off}_{ij}) \\ & + \beta_5 (\text{comlang\_ethno}_{ij}) + \beta_6 (\text{colony}_{ij}) + \beta_7 (\text{comcol}_{ij}) + \beta_8 (\text{smctry}_{ij}) + \beta_9 (\text{rta}_{ij}) \\ & + \beta_{10} (\text{landlocked}_{ij}) + \beta_{11} \ln(\text{credit}_i) + \beta_{12} \ln(\text{LSCI}_i) + \beta_{13} \ln(\text{TF}_i) + D_j + \varepsilon_{ij} \end{aligned}$$

The definitions, sources, and expected signs of all factors included in the model are summarized in Table 4. Data on trade facilitation implementation rates are calculated on the basis of 31 trade facilitation and paperless trade measures included in the third global survey conducted in 2019.<sup>9</sup> Fixed effects for partner countries ( $D_j$ ) are included both to increase estimation efficiency and to account for cross-country heterogeneity. Robust standard errors are also clustered by country pairs. The model is estimated across a cross-section of 90 reporting countries using ordinary least squares.

<sup>9</sup> Survey data for 2017 were updated based on the information collected in 2019. This is to ensure it corresponds with data from the ESCAP-World Bank trade cost database, of which the latest data year is 2017.

**Table 4: Data Source, Definition, Treatment, Source, and Expected Sign**

Variable	Definition	Data Treatment	Source	Expected Sign
$\tau_{ij}$	Comprehensive trade costs.	Average of 2015–2017	ESCAP-World Bank Trade Cost Database	
$gtariff_{ij}$	Geometric average tariff factor (1+rate) that each reporting country (i) charges to its trade partner (j) and vice versa, which can be expressed by $gtariff_{ijt} = \sqrt{tariff_{ijt} \times tariff_{jti}}$	Average of 2015–2017	World Integrated Trade Solution	+
$dist_{ij}$	Geographical distance between country i and j.	N/A	CEPII	+
$contig_{ij}$	Dummy variable of contiguity equal to 1 if country i and j share a common border and zero otherwise.	N/A	CEPII	-
$comlang\_off_{ij}$	Dummy variable of common language equal to 1 if country i and j use the same common official language and zero otherwise.	N/A	CEPII	-
$comlang\_ethno_{ij}$	Dummy variable of common language equal to 1 if a language is spoken by at least 9% of the population in both countries and zero otherwise.	N/A	CEPII	-
$colony_{ij}$	Dummy variable equal to 1 if country i and j were ever in colonial relationship and zero otherwise.	N/A	CEPII	-
$comcol_{ij}$	Dummy variable equal to 1 if country i and j had a common colonizer after 1945 and zero otherwise.	N/A	CEPII	-
$smctry_{ij}$	Dummy variable equal to 1 if country i and j were or are the same country and zero otherwise.	N/A	CEPII	-
$rta_{ij}$	Dummy variable equal to 1 if country i and j are members of the same regional trade agreement and zero otherwise.	Latest definition in 2017	Egger and Larch (2008)	-
$landlocked_{ij}$	Dummy variable equal to 1 if either country i or j is landlocked and zero otherwise.	N/A	CEPII	+
$credit_i$	Average access to credit index of country i. <sup>a</sup>	0.0001 replacement/DB2018	Distance to frontier in Doing Business	-
$LSCI_i$	Average scores of liner shipping connectivity index of country i.	Data gaps filled/2017	UNCTAD	-
$TFI_i$	Percentage of TF implementation of country i, modelled as: (a) overall TF (tfti_i); or (b) general TF (generaltf_i) + digital TF (pxbptf_i).	0.0001 replacement data in 2017	Global Survey on Digital and Sustainable Trade Facilitation: 2019	-

CEPII = Le Centre d'études prospectives et d'informations internationales, ESCAP = Economic and Social Commission in Asia and the Pacific, N/A = not applicable, TF = trade facilitation, UNCTAD = United Nations Conference on Trade and Development.

<sup>a</sup> Data for access to credit from the Doing Business Report is lagged 1 year, i.e., data from the Doing Business Report 2018 are from 2017.

Note: Where available, the average of the most recent data from 2012 onward is used in the estimation. Data filling for liner shipping connectivity index is required to ensure inclusion of landlocked economies. Port countries are used as proxies for landlocked countries' portal performance. For the trade facilitation components and credit information index, zeros are replaced by 0.0001 to prevent observations being omitted from the estimation. The lists of countries included in the analysis are presented in the annexes.

## 2.2 | Regression Analysis Results

Regression estimates of the trade cost model are shown in Table 5. The model was estimated using two trade facilitation specifications: Model (1) is estimated using the average trade facilitation implementation rate across all 31 trade facilitation measures; model (2) distinguishes between the effects of the two groups of trade facilitation measures defined in Table 4—general trade facilitation measures (transparency measures, formalities measures, and institutional measures) and digital trade facilitation measures (paperless and cross-border paperless trade measures).

On policy factors, tariffs, maritime connectivity, regional trade agreements, ease of financing, and trade facilitation implementation indicators all have the expected and statistically significant impact on trade costs. Although tariffs have fallen considerably over the past decade, further reducing them globally remains an effective way to reduce trade costs. Indeed, the models suggest that a 10% change in tariff may be expected to reduce overall trade costs by more than 5% on average. This is an important reminder of the potentially devastating effect of escalating trade tensions.<sup>10</sup>

The results also show a 10% increase in the overall implementation of trade facilitation measures will lead to a 2.9% reduction in trade costs. This is nearly twice the trade cost reduction expected by a 10% improvement in maritime connectivity (1.1%).

## 2.3 | A “What-If” Analysis

What if the region improves its trade facilitation performance? What will be the impact on trade costs? To answer these questions, counterfactual simulations (“what-if” analyses) are conducted to investigate in greater detail the potential of three “packages” of trade facilitation measures in reducing trade costs across countries: (i) measures that are binding under the WTO TFA, (ii) measures that are binding under the WTO TFA and those included in the WTO TFA but are non-binding, and (iii) binding and non-binding WTO TFA measures complemented by digital trade facilitation measures not specifically included in the WTO TFA. The following two scenarios are considered for each group:

- (i) Scenario 1: Partial trade facilitation implementation scenario. All countries that have either not implemented, or have implemented on a pilot basis trade facilitation measures, take action and achieve at least partial implementation.
- (ii) Scenario 2: Full trade facilitation implementation scenario. All countries that have not achieved full implementation of the trade facilitation measures take action and achieve full implementation.

<sup>10</sup> For an analysis of the impact of the ongoing trade tensions between the People’s Republic of China and the United States on the region see, for example, ESCAP Trade Insights No. 24.

**Table 5: Trade Cost Model Results**

Dependent Variable: ln_τ <sub>ij</sub>	Beta Coefficient		Standardized Beta Coefficient	
	Model 1 Overall Trade Facilitation (TF)	Model 2 General TF/ Digital TF	Model 1 Overall Trade Facilitation (TF)	Model 2 General TF/ Digital TF
ln_gtariff	0.509*** [5.719]	0.523*** [5.853]	0.0545*** [5.719]	0.0561*** [5.853]
ln_dist	0.202*** [47.54]	0.203*** [47.72]	0.411*** [47.54]	0.413*** [47.72]
contig	-0.110*** [-5.599]	-0.107*** [-5.469]	-0.0438*** [-5.599]	-0.0425*** [-5.469]
comlang_off	-0.0623*** [-4.332]	-0.0576*** [-3.999]	-0.0521*** [-4.332]	-0.0482*** [-3.999]
comlang_ethno	-0.00190 [-0.141]	-0.00424 [-0.314]	-0.00164 [-0.141]	-0.00366 [-0.314]
colony	-0.162*** [-10.28]	-0.163*** [-10.41]	-0.0600*** [-10.28]	-0.0604*** [-10.41]
comcol	-0.0496*** [-3.809]	-0.0503*** [-3.884]	-0.0317*** [-3.809]	-0.0321*** [-3.884]
smctry	-0.0625** [-2.076]	-0.0616** [-2.037]	-0.0171** [-2.076]	-0.0169** [-2.037]
landlocked_ij	0.296*** [31.53]	0.296*** [31.62]	0.337*** [31.53]	0.337*** [31.62]
rta	-0.0610*** [-8.713]	-0.0614*** [-8.791]	-0.0710*** [-8.713]	-0.0716*** [-8.791]
ln_credit_i	-0.0319*** [-5.537]	-0.0267*** [-4.547]	-0.0364*** [-5.537]	-0.0305*** [-4.547]
ln_lsci_i	-0.112*** [-32.12]	-0.112*** [-32.35]	-0.245*** [-32.12]	-0.245*** [-32.35]
ln_tfi_i	-0.286*** [-25.33]		-0.216*** [-25.33]	
ln_generaltf_i		-0.103*** [-6.740]		-0.0673*** [-6.740]
ln_pxbptf_i		-0.149*** [-15.67]		-0.167*** [-15.67]
Constant	1.487*** [14.09]	1.121*** [10.37]		
Observations	9,359	9,359	9,359	9,359
R-squared	0.621	0.622	0.621	0.622
Adjusted R-squared	0.614	0.615	0.614	0.615
Reporter Fixed Effects	No	No	No	No
Partner Fixed Effects	Yes	Yes	Yes	Yes

TF = trade facilitation.

Note: Presents panel regression estimates of Equation [1] using data specified in Table 4.

\*\*\* p<0.01, \*\* p<0.05, and \* p<0.1; t-stats. in square parentheses.

Source: Authors' calculations.

Table 6 shows the results of the simulation for Asia and Pacific economies. Implementation of binding and non-binding WTO TFA measures under a partial implementation scenario results in a 5% reduction in trade costs on average. The more ambitious full implementation scenario shows a 9% reduction. In contrast, implementing only binding WTO TFA measures results, at best, in approximately 6% decrease in trade costs on average in these countries. Under a WTO TFA+ scenario where digital trade facilitation measures not included in the WTO TFA are implemented, the average trade cost reduction across countries increases to more than 16%.

**Table 6: Changes in International Trade Costs of Asia and the Pacific as a Result of World Trade Organization Trade Facilitation Agreement Implementation (%)**

Asia and the Pacific: Trade Costs Model	WTO TFA (binding only)		WTO TFA (binding + non binding)		WTO TFA+ (binding + non binding + other paperless and cross-border paperless trade)	
	Partially implemented	Fully implemented	Partially implemented	Fully implemented	Partially implemented	Fully implemented
<b>Model 1</b>						
Overall trade facilitation	-2.84	-5.79	-4.57	-9.39	-10.52	-16.92
<b>Model 2</b>						
General trade facilitation measures	-1.52	-3.05	-1.99	-4.29	-2.35	-4.76
Digital trade facilitation measures	-	-	-1.97	-3.23	-9.53	-13.34

WTO TFA = World Trade Organization Trade Facilitation Agreement.

Source: Authors' calculations.

Table 6 also shows the average trade cost reduction in Asia and Pacific economies and the rest of the world associated with two different groups of trade facilitation measures. Both partial and full implementation scenarios suggest that, among WTO TFA measures, those related to enhancing transparency and simplifying formalities will have the highest impact on trade costs on average, both in binding and non-binding measures. The largest reduction of trade costs, however, comes through partial or full implementation of paperless trade measures beyond those required or specified in the WTO TFA.

The country-level results of the counterfactual simulation suggest that many developing economies in the region can expect only a limited reduction in trade costs from their WTO TFA implementation. This can be explained by the fact that they have already implemented most of the measures featured in the agreement, as often indicated in the notifications they have submitted to the WTO. This is particularly true for ASEAN and East Asian economies, which initiated implementation of single windows and other advanced WTO TFA measures well before the agreement was concluded.

For those countries, making further progress in reducing trade costs and trade facilitation necessarily implies a WTO TFA+ approach, in particular focusing on applying frontier technologies to trade procedures (such as artificial intelligence and blockchain technology) and on enabling seamless electronic exchange of data and documents across countries (cross-border paperless trade).

It is also useful to examine trade cost reductions that may be associated with trade facilitation reforms of a broader scope, which may encompass improvements in transport and other trade-related infrastructure and services.<sup>11</sup> In that context, the following additional simulation was conducted using regression estimates:

- (i) Scenario 3: Improvement in maritime connectivity. Countries with liner shipping connectivity index scores below the developing country average/high income (Organisation for Economic Co-operation and Development [OECD]) average take action to bring their scores to equivalent levels;
- (ii) Scenario 4: Improvement in access to financing. Countries with Access to Credit scores below the developing country average/high income OECD average take action and bring their scores to equivalent levels.

**Table 7: Changes in Trade Cost of Asia and the Pacific from Better Port Connectivity and Trade Finance (%)**

Asia and the Pacific	Improve to Developing Economies' Average (Model 1/Model 2)	Improve to OECD Average (Model 1/Model 2)
Maritime connectivity	-3.71%/-3.71%	-6.37%/-6.38%
Access to finance	-0.57%/-0.48%	-0.96%/-0.81%

OECD = Organisation for Economic Co-operation and Development.

Source: Authors' calculations.

As Table 7 shows, the simulation results suggest that improving maritime connectivity, as described in scenario 3, would reduce trade costs in Asia and the Pacific by 4% to 6%. In turn, improved access to finance by improving access to credit (scenario 4) could reduce trade costs by 0.5% to 1%. While they cannot be easily compared with the impacts presented earlier on the implementation of WTO TFA and paperless trade measures, the trade costs reductions associated with both maritime connectivity and access to finance appear to be very significant, pointing to the benefits of a more holistic approach to trade facilitation and reducing international trade transaction costs.<sup>12</sup>

<sup>11</sup> See WTO World Trade Report 2015 for a recent and rather comprehensive discussion of trade facilitation definitions. Available at [https://www.wto.org/english/res\\_e/booksp\\_e/world\\_trade\\_report15\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/world_trade_report15_e.pdf).

<sup>12</sup> Notably, these estimates are calculated using the same group of countries in earlier simulations; they include a significant number of Asia and Pacific developing countries which see no individual cost reductions under the scenarios, because their maritime connectivity and credit information systems are already at or above the developing economies' average (or even the high-income average in the case of access to credit). Country-level analysis shows trade cost reductions from improving maritime connectivity for below average countries are significantly larger than those from WTO TFA implementation.

## 3

## Conclusion and Way Forward

The regional analysis of data from the 2019 Global Survey on Digital and Sustainable Trade Facilitation shows acceleration in the implementation of trade facilitation since 2017. Asia and the Pacific saw trade facilitation implementation progressing by more than 10 percentage points over the last 2 years, compared to less than 5 percentage points between 2015 and 2017. Most countries in the region are actively engaged in implementing measures to improve transparency, streamline trade formalities, and enhance interagency cooperation. Customs services in virtually all countries have developed computerized systems to speed up clearance while improving control. Nearly 70% of the region's economies are also working on national electronic single windows.<sup>13</sup>

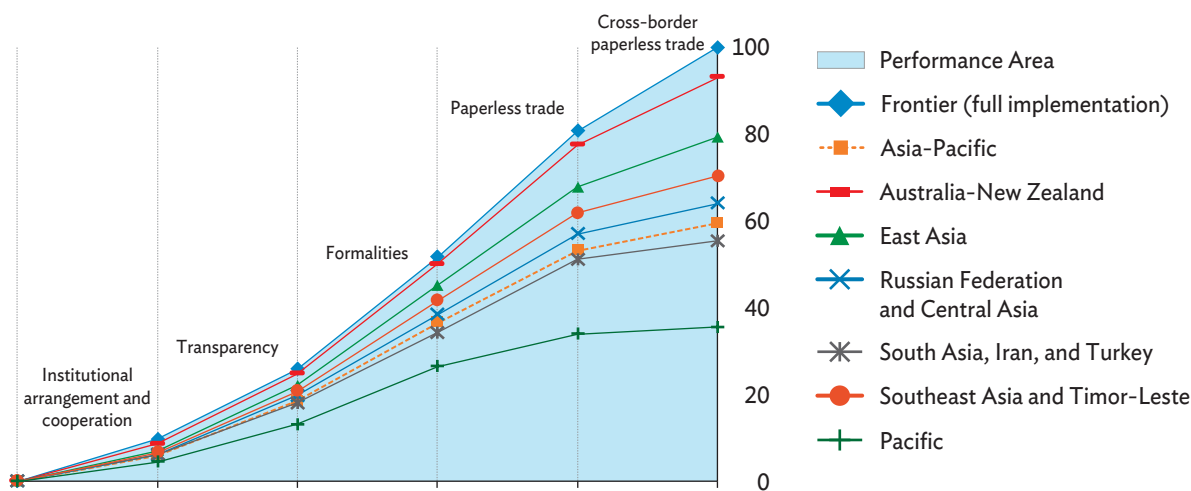
However, much remains to be done. At least one-third of the countries working on national electronic single windows are only at the planning and/or pilot stage. Implementation of cross-border (bilateral, subregional, or regional) paperless trade systems also remains mostly at the pilot stage—a notable exception being ASEAN members, who began exchanging live preferential certificates of origin through the ASEAN Single Window in November 2018.<sup>14</sup> The assessment presented, based on the latest data available, confirms that digital trade facilitation measures will bring substantial benefits to the countries in Asia and the Pacific. Implementation of a WTO TFA+ digital trade facilitation scenario, in which paperless and cross-border paperless trade measures are implemented, results in an average reduction in international trade costs in the region of 16%, seven percentage points more than can currently be expected from implementation of the WTO TFA.

Moving forward, trade facilitation implementation may be seen as a step-by-step process, based on the groups of measures included in the UN global survey (Figure 7). It begins with strengthening the *institutional arrangement* needed to develop and implement a trade facilitation strategy. The next step is to ensure a more *transparent* trade process by sharing information on existing regulations as widely as possible and ensuring stakeholders are consulted when developing new ones. Reducing or designing more efficient trade *formalities* is next. The re-engineered processes may first be implemented based on paper documents, but can then be improved by developing *paperless trade* systems. The ultimate step is to enable trade data and documents within a national single window and other systems to be safely and securely used and reused by authorized stakeholders along the international supply chain to speed up the movement of goods and reduce the overall trade costs.<sup>15</sup>

<sup>13</sup> See ESCAP. 2019a. Figure 15, p. 31.

<sup>14</sup> <http://asw.asean.org/index.php/news/item/launch-of-the-asean-single-window-live-operation>

<sup>15</sup> This step-by-step process is inspired from and generally consistent with the UN/CEFACT step-by-step approach to trade facilitation toward a single window environment.

**Figure 7: Toward Seamless International Supply Chains: Moving Up the Trade Facilitation Ladder**

Note: The figure shows cumulative trade facilitation implementation scores of Asia and Pacific subregions for five groups of trade facilitation measures included in the survey. Full implementation of all measures = 100.

Source: ESCAP (2019a).

This ultimate step will require persistence and visionary leadership within the region. Emerging technologies may make it relatively easier to implement, but the real challenge is not technical. It is in the will, both at political and operational levels, to change the way trade is conducted—and to make international trade transactions still more transparent and efficient. In this respect, the Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific, as a United Nations (UN) treaty developed by more than 25 countries at very different stages of development, provides the inclusive and flexible intergovernmental platform needed to accelerate progress, while leaving no one behind in this important area. All countries in the Asia and the Pacific are encouraged to become a party to the treaty as soon as possible to ensure issues of interest to them can be prioritized under the framework, including in terms of capacity building and technical assistance.

As countries continue to invest time and resources in trade facilitation, it is important to give special consideration to those stakeholders and sectors with special needs. Data from the 2019 UN global survey reviewed here highlighted the lack of trade facilitation programs and measures specifically targeted at SMEs and women and, to a lesser extent, to the food and agricultural sector, all of which are keys to the sustainable and inclusive development of economies in the region. All countries are encouraged to ensure that these groups and sectors are included in institutional arrangements for trade facilitation, so their needs can be more readily identified and addressed.<sup>16</sup>

<sup>16</sup> See ITC and ESCAP (2015) for practical guidance on facilitating trade for SMEs.



Finally, it remains important to ensure that trade facilitation efforts focus on results, i.e., making licit trade easier and less costly for all, rather than on achieving basic compliance with legal provisions in one or more international treaty or convention. The quantitative analysis presented above confirms, unsurprisingly, that transport connectivity and trade finance also have important impacts on the cost of trade. These elements may therefore be integrated in trade facilitation action plans, together with other relevant elements, such as the facilitation of commercial and payment procedures. To this end, trade facilitation strategies should be designed in a more holistic and pragmatic manner, in full consultation with public and private sector parties engaged in trade.

## REFERENCES

- Arvis, J., et al. 2016. Trade Costs in the Developing World: 1996–2010. *World Trade Review*. 15(3). pp. 451–474. doi:10.1017/S147474561500052X.
- Duval, Y., et al. 2019. Next-generation Trade Facilitation for Asian Integration: Cross-border Paperless Trade. *Journal of Asian Economic Integration*. 1(1). pp. 11–31. <https://doi.org/10.1177/2631684618821473>.
- Egger, P. H., and M. Larch. 2008. Interdependent Preferential Trade Agreement Memberships: An Empirical Analysis. *Journal of International Economics*. 76(2). pp. 384–399.
- ESCAP. 2017. *Digital Trade Facilitation in Asia and the Pacific*. Bangkok. <https://www.unescap.org/publications/digital-trade-facilitation-asia-and-pacific-studies-trade-investment-and-innovation-87>.
- . 2019a. Digital and Sustainable Trade Facilitation Implementation in Asia and the Pacific: 2019 Update. *Trade Insights* No. 28. Bangkok.
- . 2019b. Implementation of the WTO Trade Facilitation Agreement in Asia and the Pacific: 2 Years on. *ESCAP Trade Insights* No. 26. Bangkok.
- ESCAP and ADB. 2014. *Towards a National Integrated and Sustainable Trade and Transport Facilitation Monitoring Mechanism: BPA+*. ST/ESCAP/2683. Bangkok. <https://www.unescap.org/resources/towards-national-integrated-and-sustainable-tradeand-transport-facilitation-monitoring>.
- ESCAP and World Bank. *ESCAP-World Bank Trade Cost Database*. <https://artnet.unescap.org/databases#first> (accessed July 2019).
- ITC and ESCAP. 2015. *Making the WTO Trade Facilitation Agreement Work for SMEs*. <https://www.unescap.org/sites/default/files/MakingWTOTFAWorkforSMEs.pdf>.
- United Nations (UN). *Global Survey on Digital and Sustainable Trade Facilitation*. <https://unfssurvey.org> (accessed August 2019).
- UN/CEFACT. 2017. *Establishment of a Trade and Transport Facilitation Monitoring Mechanism*. [https://www.unece.org/fileadmin/DAM/cefact/recommendations/rec42/ECE\\_TRADE\\_C\\_CEFACCT\\_2017\\_8E\\_R1\\_Rec42.pdf](https://www.unece.org/fileadmin/DAM/cefact/recommendations/rec42/ECE_TRADE_C_CEFACCT_2017_8E_R1_Rec42.pdf).
- World Trade Organization. 2015. *World Trade Report 2015: Trade Facilitation*. Geneva. pp. 108–123. [https://www.wto.org/english/res\\_e/booksp\\_e/world\\_trade\\_report15\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/world_trade_report15_e.pdf).
- . 2017. *Trade Facilitation*. Geneva. [https://www.wto.org/english/tratop\\_e/tradfa\\_e/tradfa\\_e.htm](https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm).



## **THEME CHAPTER**

# **BRIDGING TRADE FINANCE GAPS THROUGH TECHNOLOGY**

# 1

## Introduction

International trade and the policy reforms that support it are widely known to benefit inclusive growth. Trade reallocates production inputs to align them with an economy's comparative advantage; while lowering tariffs, removing other trade barriers, and harmonizing customs procedures help enhance trade and its impact on economic growth and poverty reduction. Production and transactions that underlie cross-border trade generally require some sort of financing and payment assurance in the process of production and shipment of goods. In developing economies, many banks may be unable to provide enough guarantees and insurance to meet market demand due to high funding costs. Small and medium-sized enterprises (SMEs) may not have proper access to trade finance because they lack collateral and credit history.

The 2008/09 global financial crisis and associated drop in global trade brought greater attention to the key role trade finance plays. Tightening credit limits on trade finance played a significant role in the trade collapse during the crisis, while a fall in demand was its primary cause.<sup>17</sup> The economic disruption prompted banks to tighten financial controls and raise interest rates. New Basel III regulatory requirements in response to the crisis required banks to have more regulatory capital and comply with new liquidity requirements. This contributed to a decline in cross-border bank loans to emerging economies from banks in advanced economies.

Policy makers have been strengthening initiatives to mitigate the negative impact of unmet demand for trade finance. National ECAs are trying to enhance financial access for SMEs, while multilateral development banks are helping scale up support through trade finance programs. Basel III regulations are also being adjusted for trade finance instruments to account for their lower risk and short-term nature.

However, the large unmet demand for trade finance persists. This is associated with higher transaction and information costs related to dealing with smaller companies. High costs also make it unprofitable for small businesses to use trade finance instruments such as letters of credit. The global trade finance gap is estimated at around \$1.5 trillion, with 40% of the gap originating in Asia and the Pacific (ADB 2019a, 2017a). Moreover, 45% of rejected trade finance transactions come from SMEs. Female-owned firms, which account for 40% of micro, small, and medium-sized enterprises (MSMEs) in Asia are more financially constrained than male-owned businesses.

---

<sup>17</sup> Trade finance disruptions were found to have a secondary but significant role in the reduction of trade volumes in the world following the Lehman Brothers bankruptcy, with reduced global demand for capital goods and consumer durables as the main driver. The global financial crisis also exacerbated problems for exporters obtaining short-term export credit insurance. One-fifth of the decline in trade volumes during the crisis can be attributed to reduced availability of trade finance (CGFS 2014).

Innovation and technology show potential to enhance the efficiency and availability of trade finance that could also benefit smaller enterprises. Digital technologies are being harnessed to minimize the large paper-based documentation usually associated with trade finance, reduce the likelihood of errors, and enhance due diligence. More importantly, digital financial services allow other forms of payment and finance coursing through the formal banking system. However, progress is far from complete. Digitalization faces several challenges, such as the high cost of adopting the technology and lack of international rules and standards covering digital trade.

This thematic chapter discusses the role technology plays in facilitating access to trade finance and various factors in adopting technology that can help banks, SMEs, and other stakeholders benefit most. Section 2 reviews the trade finance market. Section 3 discusses the trade finance gap, issues, and challenges in providing trade finance. Section 4 examines new technologies with the most potential to facilitate trade finance, and then discusses issues in increasing technology adoption. The last section considers policies that could support trade finance and allow greater technology adoption.

## 2

# The Trade Finance Market

## 2.1 | Market Structure

**Broadly, the trade finance market can be divided into bank-intermediated and interfirm markets.**

Bank-intermediated trade finance performs two vital roles: it provides (i) working capital tied to and in support of international trade transactions and (ii) a means to reduce payment risk (BIS 2014).

The principal alternative to bank trade finance is interfirm trade credit between importers and exporters (commonly referred to as *trade credit*). This includes open account transactions, where goods are shipped in advance of payment, and cash-in-advance transactions, where payment is made before shipment.

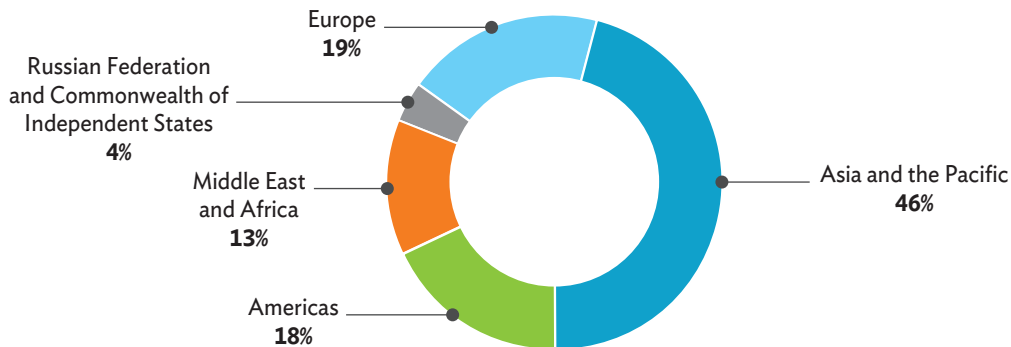
**Around 40% of global goods trade is supported by bank-intermediated trade finance and 60% by interfirm trade credit.** Letters of credit (LC) are the most commonly used product in the bank-intermediated trade finance market, followed by documentary collections, supply chain financing, and guarantees (Table 1). Open accounts dominate interfirm trade credit transactions. In 2017, only 13% of these were Export Credit Agency (ECA)-supported, with only 0.12% financed by multilateral development banks (see Annex 1 for a complete breakdown). By region, around two-thirds of trade finance applications originated from Asia and the Pacific (46% by value) (Figure 1).

**Table 1: Market Share by Transaction Type (2017)**

Interfirm Trade Credit (60%)	Bank-Intermediated Trade Finance (40%)		
<b>Open account</b>	<b>Letters of credit</b>	<b>Supply chain finance</b>	<b>ECA-supported</b>
40%	20%	6%	13%
\$7.1 trillion	\$3.6 trillion	\$1.1 trillion	\$2.3 trillion
<b>Cash-in-advance</b>	<b>Documentary collections</b>	<b>Guarantees</b>	<b>MDB-financed</b>
20%	8%	5%	0.12%
\$3.5 trillion	\$1.4 trillion	\$1.0 trillion	\$20.9 billion
<b>Global Merchandise Export, 2017</b>			
\$17.7 trillion			

ECA = export credit agency, MDB = multilateral development bank.

Sources: ADB, based on ADB (2017a), Bank for International Settlements (2014), International Chamber of Commerce (2018), Malaket (2014), and World Trade Organization (2018).

**Figure 1: Trade Finance Applications in Value by Region (2016)**

Source: ADB (2017a).

**A letter of credit (LC), a major instrument in the bank-intermediated market, involves two banks—one each for the seller and buyer—providing guarantees for the payment obligations in favor of the seller.**

After a sales agreement has been signed, the buyer requests his bank (the issuing bank) to issue an LC in favor of the seller (Figure 2). The issuing bank then transmits it to the seller’s bank (the “confirming bank” in LC transactions), which in turn provides an additional guarantee to the seller in the event that the buyer and the issuing bank do not fulfill their payment obligations.<sup>18</sup> Once these steps have been taken, the seller ships the goods, presents the shipping documents to the confirming bank, which pays for the transaction. The confirming bank then releases the shipping documents to the issuing bank, which then forwards it to the buyer. The buyer fulfills its payment obligation with the issuing bank, which then reimburses the confirming bank for the money paid to the seller.<sup>19</sup>

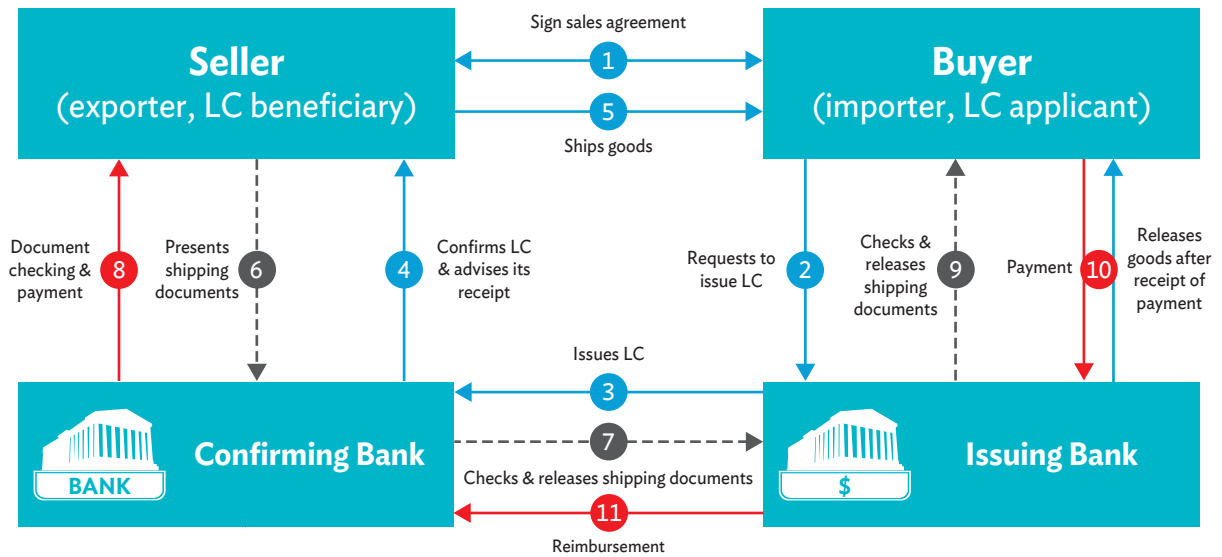
LCs are decreasing in an increasingly competitive international trade environment. Open account transactions, however, where importers can pay after receiving the goods, are becoming more prevalent (Foley, Johnson, and Lane 2010) (Figure 3). Firms use open accounts as a competitive strategy to strengthen product–market relationships. Suppliers are also more knowledgeable of the capital needs, creditworthiness, and business conditions of their clients. In addition, open account financing is preferred over bank financing in countries with less developed financial sectors.

**In the interfirm trade finance market, open account and cash-in-advance are the two major types of transactions.** In open account transactions, the seller ships the goods ahead of payment by the buyer, who only sends the payment through interbank transfers once the goods have been received in good condition.

<sup>18</sup> For unconfirmed letters of credit, the seller’s bank (called an “advising bank”) only helps facilitate the transaction and does not provide any guarantee for the payment obligation.

<sup>19</sup> Another trade finance instrument, called “documentary collection” works similarly to an LC, without any bank guaranteeing the payment obligation. In a documentary collection, the seller ships the goods after an agreement is made with the buyer. The seller gives the shipping documents to its bank (called the “remitting bank”), which then forwards the documents to the buyer’s bank (called the “collecting bank”). It is only when the buyer pays that they get the shipping documents and claims the goods from the shipper.

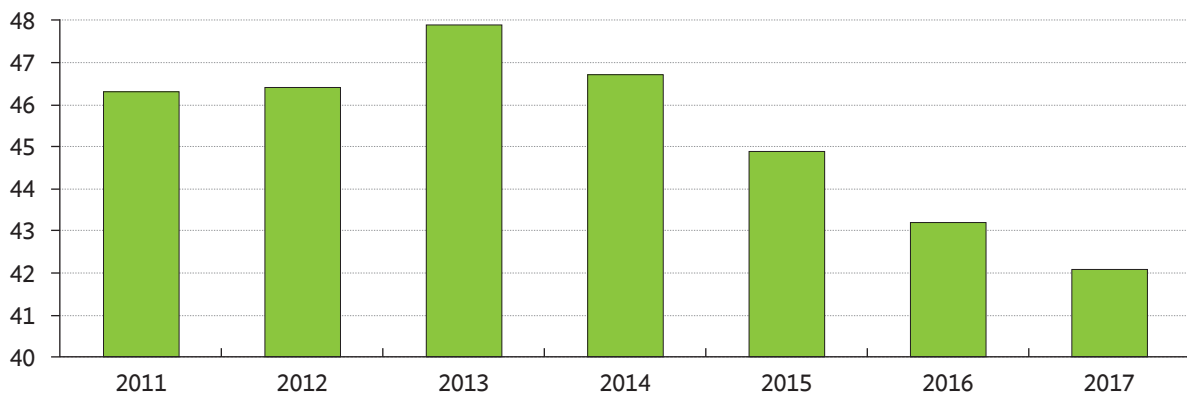
**Figure 2: Confirmed Letter of Credit Transactions**



LC = letter of credit.

Source: ADB, based on International Chamber of Commerce (2014).

**Figure 3: Letter of Credit Volume on SWIFT, 2011–2017 (million)**



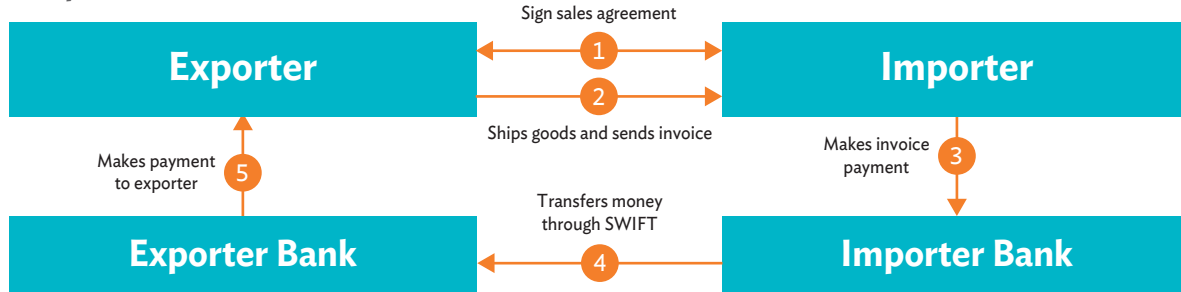
Source: International Chamber of Commerce (2018).

No bank instruments (for example, guarantees) are involved and transaction success depends on the trust between the seller and buyer (with the seller bearing the most risk). Cash-in-advance, on the other hand, means the buyer pays the seller before the goods arrive. In this case, the buyers bear the risk of not receiving the goods despite having paid (Figure 4).

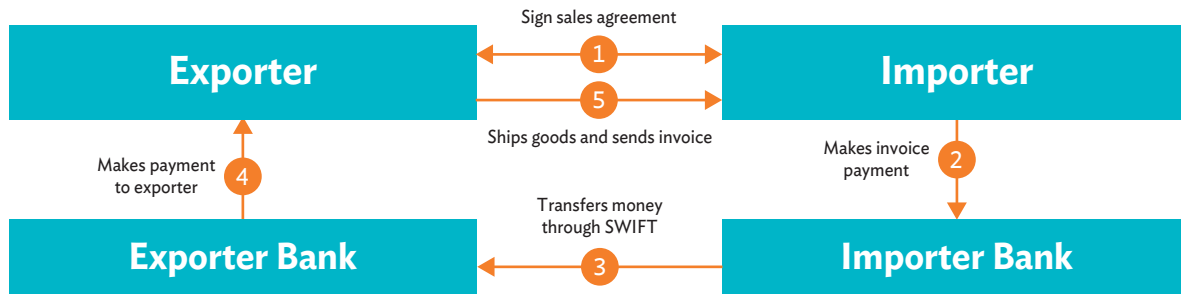


**Figure 4: Open Account and Cash-in-Advance**

**A. Open account**



**B. Cash-in-advance**



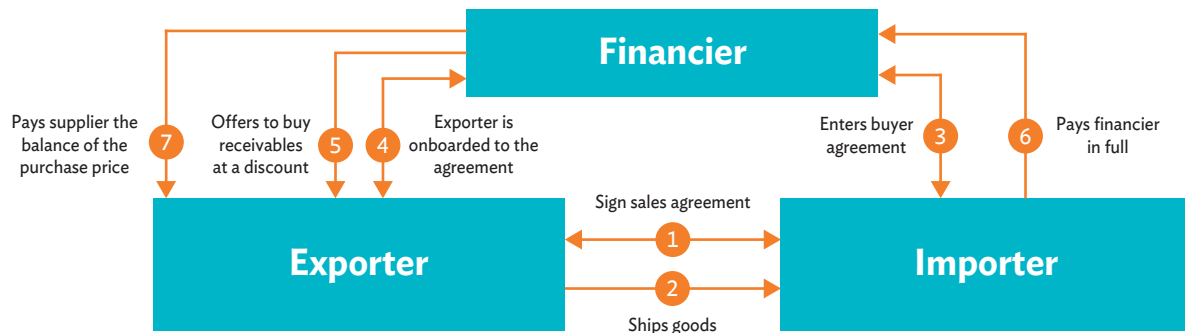
SWIFT = The Society for Worldwide Interbank Financial Telecommunications.  
 Source: Simmons and Simmons (2015).

**Other popular forms of trade finance transactions include factoring and forfaiting.** In factoring and forfaiting, the exporter sells its receivables to the factor or forfaiter at a discounted price. The exporter thus transfers the risk of nonpayment to the factor or forfaiter in exchange for a lower price, as well as the responsibility to collect the debt—differentiating these from receivables discounting. One difference between factoring and forfaiting (Table 2) is that forfaiting normally requires a documentary payment obligation (for example, an LC or guarantee) from the importer’s bank and they assume the importer’s nonpayment risk, leaving exporters who sold the receivables with no liability.

**Table 2: Differences between Factoring and Forfaiting**

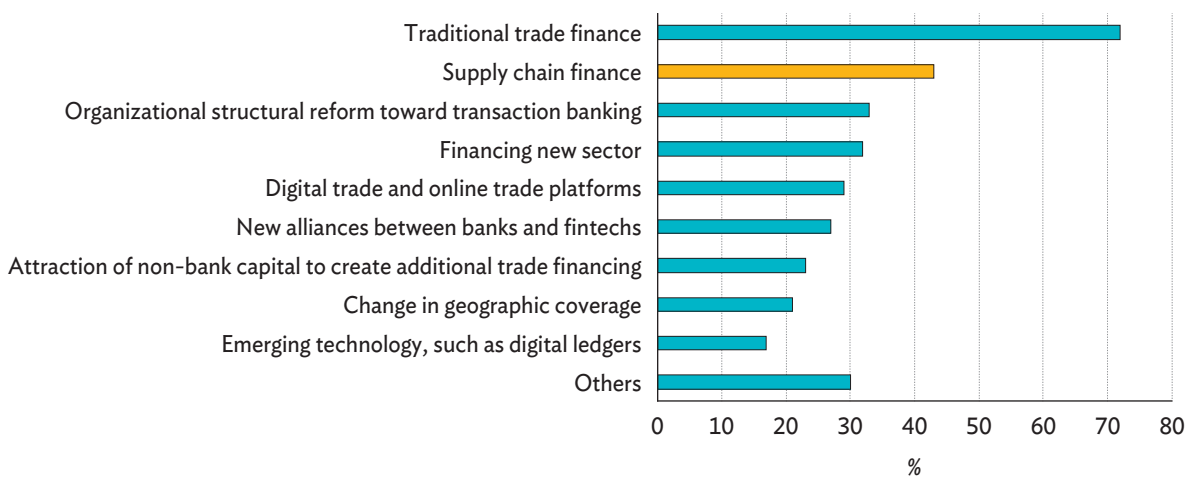
	Factoring	Forfaiting
Maturity of receivables	Short maturities	Medium to long-term maturities
Finance up to	80%–90%	100%
Type	Recourse or non-recourse	Non-recourse
Cost	Borne by the seller (client)	Borne by the overseas buyer
Secondary market	No	Yes

Source: Surbhi (2016).

**Figure 5: Supply Chain Finance/Payable Finance**

Sources: Simmons and Simmons (2015); and International Chamber of Commerce (2018).

**Supply chain finance is a relatively new form of finance in which a bank purchases the receivables of the supplier to an investment-grade buyer and collects the debt from the supplier at maturity.** Supply chain finance programs, which usually involve large-scale buyers, aim to provide liquidity to supply chains, including downstream providers and upstream brokers (Figure 5). The buyer, with a better credit rating, can acquire financing at lower rates and larger volume, so their suppliers can fund operations at low cost. In recent years, supply chain finance grew because it allows large amounts of funds to be mobilized in a supply chain by speeding up the cash conversion cycle and thus enhancing working capital efficiency (Malaket 2014). Banks also see supply chain finance as a priority growth area in the evolving finance of international trade (Figure 6).

**Figure 6: Priority Areas for Bank Development and Strategic Focus (next 12 months)**

Source: International Chamber of Commerce (2018) based on surveyed bank responses.

## 2.2 | Risk Management through Trade Finance

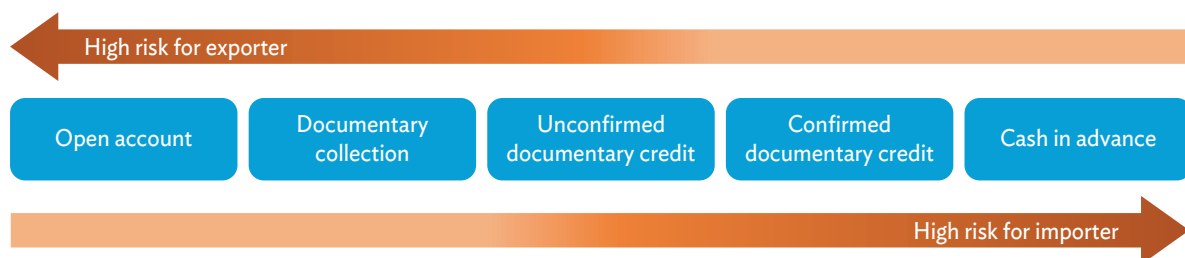
Trade finance helps reduce risks associated with international trade—such as commercial, exchange rate, transportation, and political risk. Commercial risk is that the importer fails to pay or when they refuse to accept delivery. Exchange rate risk stems from highly volatile exchange rates or devalued currencies. Goods may also get damaged in transit (transportation risk), while wars, revolts, and nonconvertible currencies are also possible (political risk). To mitigate these, parties can use bank guarantees, exchange risk insurance, or private insurance, depending on the risks they want to avoid (Malaket 2014).

### Depending on risk assessments, exporters and importers use different types of trade finance transactions.

Exporters rely more on open accounts if the risk the importer will default is low. They use LCs if the risk is intermediate, and cash-in-advance if the risk is high (Niepmann and Schmidt-Eisenlohr 2017) (Figure 7).

- Cash-in-advance requires payment before the goods are shipped, which is the most secure mode of payment for exporters. It is advisable to use cash-in-advance terms when the importer is a new customer, the importer's creditworthiness is in doubt, the importer's home country's political and commercial risks are high, the exporter's product is unique, or the exporter operates an internet-based business where credit card payments are needed to be competitive.
- An open account, where goods are shipped before payment is due, is least secure for exporters. The contracted goods are produced and shipped to the buyer with all production and shipping costs incurred by the exporter. This is best in low-risk trading and in competitive markets to win customers over other exporters.
- For documentary collections, exporters and importers rely on their respective banks to facilitate the exchange of documents and payments or remittances. However, there is no verification process and traders have limited recourse in case of nonpayment. Although riskier than LCs, documentary collection terms are more convenient and less costly.
- LCs or documentary collections are a more secure means of payment that protect the seller. Higher protection is afforded through confirmed LCs, where the exporter asks the importer to have its bank authorize a bank in the exporter's country to confirm payment to the exporter's bank. This is especially useful when selling in high-risk markets.

**Figure 7: Degree of Risk by Transaction Type**



Source: ADB, based on Malaket (2014).

## 2.3 | Policy-Oriented Trade Finance

**Trade finance is recognized as a significant factor in maximizing a country's trade potential and using it for economic development.** The Addis Ababa Agenda states that lack of access to trade finance can result in missed opportunities to use trade as an engine for development.<sup>20</sup> Trade (and policies that promote trade) holds significant development benefits and can help achieve 16 of the 17 Sustainable Development Goals (Helble and Shepherd 2017). Its impact on consumer and producer prices, as well as wages, can reduce poverty and hunger while making growth more inclusive. Trade has also been shown to help increase access and investment in education and health.

**Global initiatives have been strengthened to promote trade finance and monitor its progress.**

The WTO has focused on boosting trade finance for developing economies since 2005 in cooperation with the World Bank and other MDBs. The International Chamber of Commerce (ICC) annual *Global Survey on Trade Finance* analyzes regional and global trends in trade and trade finance. Its *Trade Register* presents the industry's outlook on the risks of default, while its *Standard Definitions for Techniques of Supply Chain Finance* addresses the global need for a common understanding of terminology and techniques related to supply chain finance. In 2009, the Group of Twenty (G20) committed to greater co-lending and risk-sharing between banks and international and national institutions. The G20 Shanghai statement in 2016 underscored the importance of trade finance.<sup>21</sup> In 2018, an intergovernmental agreement on financing for development under the United Nations (UN) called for ECAs and MDBs to further develop trade and supply chain finance programs (UN Economic and Social Council 2018).

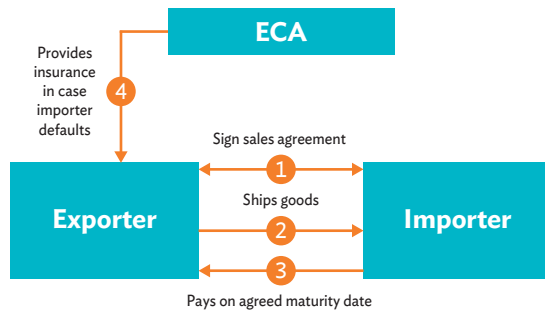
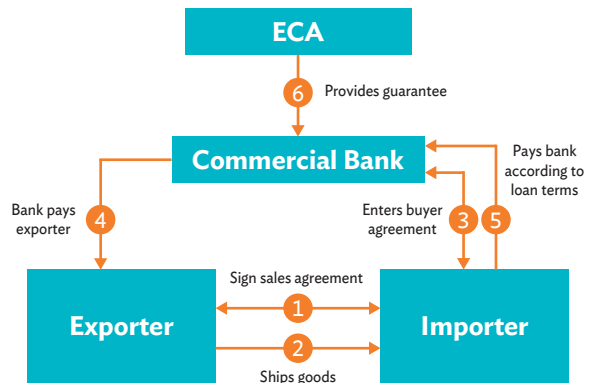
**ECAs, which include export–import banks, typically provide trade finance either directly as a loan or indirectly as insurance or a guarantee on a commercial loan.** Export credit insurance covers the exporter's payment to its foreign counterparts in case the importer defaults on its payment obligations. An ECA loan and guarantee gives a commercial bank in the jurisdiction of an exporter a guarantee that allows the bank to lend to an overseas buyer to finance the purchase of goods and services from the exporter (Figure 8).

**National ECAs finance exports and are generally government-owned.** National ECAs played a key role in mitigating the negative impact of reduced trade during the 2008/09 global financial crisis as private insurers limited exposure to short-term credit.<sup>22</sup> Compared to commercial banks that extend short-term credit using market-determined interest rates, ECAs are more moderate and geared toward SME trade finance, enabling exporters to offer favorable and competitive credit terms to foreign buyers (Box 1). ECAs also provide medium- and long-term (3, 5, 7, and up to 10 years) loans for capital goods exports and large infrastructure projects, in addition to short-term (less than 1 year) export trade credit. Only 18 of 49 countries in Asia and the Pacific have ECAs, the majority in high and middle-income countries (Annex 2).

<sup>20</sup> Adopted in the 2015 Third International Conference on Financing for Development in Addis Ababa, Ethiopia, the Action Agenda (i) commits to exploring use of market-oriented incentives to expand WTO-compatible trade finance and the availability of trade credit, guarantees, insurance, factoring, LCs, and innovative financial instruments (including for MSMEs in developing countries); and (ii) calls on development banks to provide and increase market-oriented trade finance and to examine ways to address market failures associated with trade finance.

<sup>21</sup> According to the United Nations Inter-Agency Task Force on Financing for Development (UN-IATFFD) Website. Ongoing Activities. <https://developmentfinance.un.org/sub-cluster/1358/1474>.

<sup>22</sup> During the peak of the crisis in mid-2008, both ECAs and private insurers decreased short-term credit limits. However, the share of ECAs' short-term credit limit increased to 21% in 2009 from 15% during 2006/08, while the private insurers' share declined to 79% from 85%. In 2010, the share of short-term credit limits from private insurers decreased further to 72%, while the share from ECAs increased to 28%, almost double the credit limits insured during 2006/08 (Morel 2011).

**Figure 8: Trade Finance Provided by Export Credit Agencies****(a) Export Credit Insurance, Short Term****(b) Export Credit Agency Loan and Facility Guarantee, Medium and Long Term**

ECA = export credit agency.

Source: Simmons and Simmons (2015).

### Box 1: Export Credit Agency Support for Small and Medium-Sized Enterprises in Thailand and the Republic of Korea

#### EXIM Thailand—various export credit or insurance products for SME exporters

In 2016, the Export–Import Bank of Thailand (EXIM Thailand) launched a new service called *Instant SMEs Export Insurance*, “offering a shortened application process and prompt approval within 1 day, as well as claims payment of up to THB1 million in case of nonpayment by foreign buyers.” In 2017, EXIM Thailand launched another new product, called *EXIM Export Credit Plus*, which is denominated in both Thai baht and US dollars. EXIM Export Credit Plus provides SME exporters and export-oriented manufacturers capital lines up to THB50 million, a first-year 4.5% interest rate, and a collateral requirement of only 25% of the loan value, accompanied by an export credit insurance facility with 90% maximum coverage of damages arising from foreign buyer nonpayment. In 2018, EXIM Thailand launched *EXIM Happy Credit*, a facility designed to assist SME exporters, especially those without collateral, offering lines of up to THB500,000 and a first-year 4.5% interest rate.

#### Korea Trade Insurance Corporation—group insurance scheme for SME exporters

For SME exporters, knowing what trade finance products are available in the market and high product fees are two major barriers to accessing trade financing. To address these, the Korea Trade Insurance Corporation (KSURE) has been offering “group” export insurance products since 2013.

*continued next page*

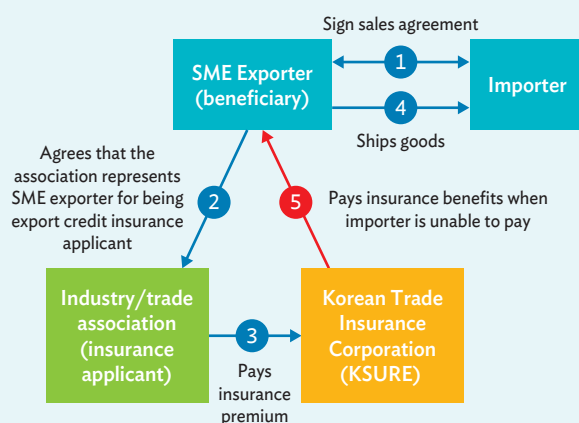
**Box 1: Continued**

Under the scheme, SME exporters are insured through their agents (insurance applicants), such as commercial banks or industry or trade associations.

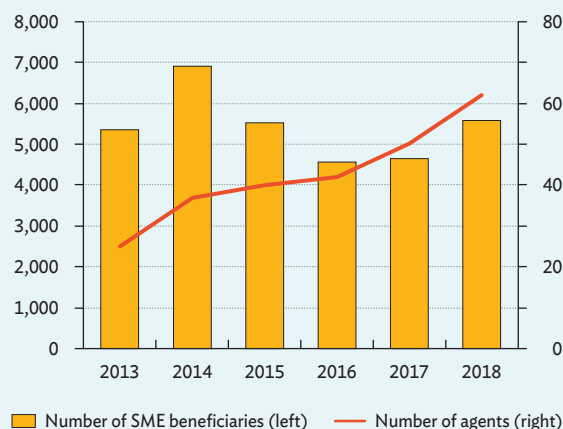
- SMEs eligible for group insurance have annual exports less than (i) \$100,000 or (ii) \$30 million, and must meet minimum credit rating requirements set by the KSURE.
- SME exporters under (i) are covered up to \$20,000 per year, while exporters under (ii) up to \$50,000 per year when importers are unable to pay.
- Applying SMEs are offered a lower insurance premium rate, whereas they would have to pay about 1.0% premium rate or more with a contract directly with KSURE.

The number of agents has steadily increased since 2013. In 2018, 5,571 SME exporters were supported and 62 agents worked as insurance applicants for those SMEs.

### Structure of the Group Export Credit Insurance in the Republic of Korea



### Trends of SME Beneficiaries and Agent since 2013



SMEs = small and medium-sized enterprises.

Source: ADB, based on KSURE (2018) and consultation with KSURE; EXIM Thailand (2016, 2017, 2018).

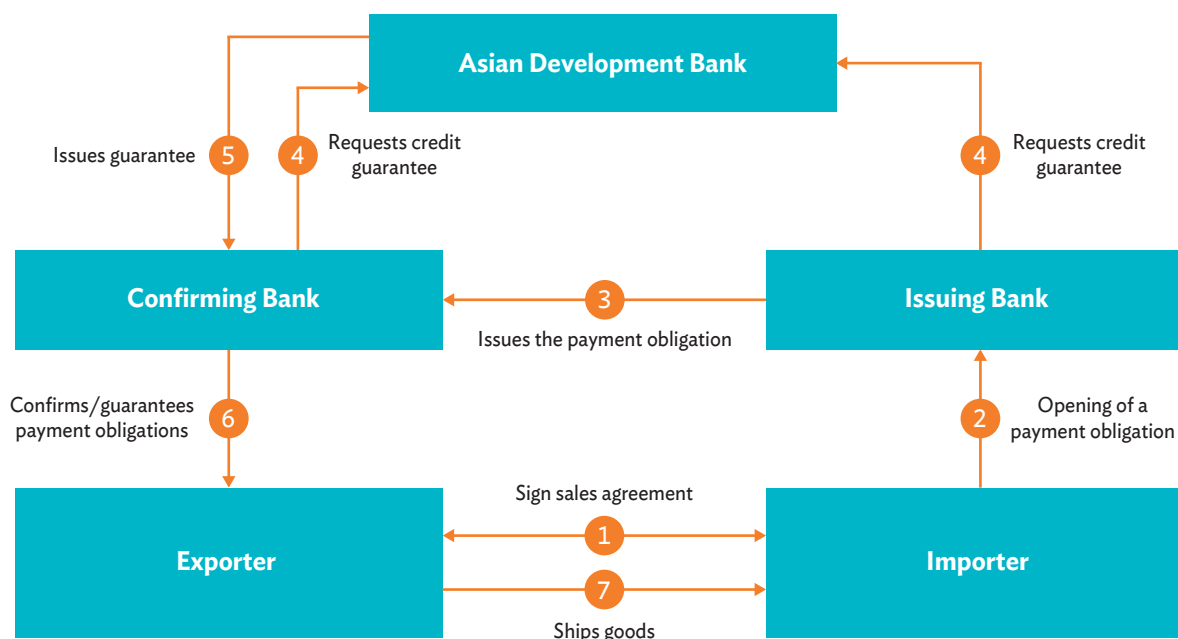
**International organizations offer various trade finance programs.** In Asia and the Pacific, which accounts for 40% of the unmet trade finance demand (ADB 2017a), ADB provides guarantees and loans through its Trade Finance Program (ADB-TFP) to support international trade (Table 3). From 2009 to 2018, ADB supported \$36.3 billion worth of transactions, cofinancing \$21.6 billion. Among ADB-TFP beneficiaries, 15,688 were SMEs (ADB 2019b). ADB offers credit guarantees to issuing and/or confirming banks (Figure 9), along with risk participation agreements, revolving credit facilities, risk distribution agreements, and knowledge products on trade finance (Box 2).

**Table 3: Trade Finance Transactions of International Organizations**

ADB	AfDB	EBRD	IDB	IFC	ITFC
<b>Program Title</b>					
Trade Finance Program (TFP)	Trade Finance Programme (TFP)	Trade Facilitation Programme	Trade Finance Facilitation Program (TFFP)	Global Trade Finance Program (GTFP)	ITFC Trade Finance Program (TFP)
<b>Number of countries of operation</b>					
22	49	26	21	85	51
<b>Program commencement</b>					
2004	2013	1999	2005	2005	2008
<b>Types of financial products</b>					
1. Guarantee Products: Credit Guarantee; Risk Participation Agreement 2. Funded Products: Revolving Credit Facility; Funded Risk Participation Agreement 3. Distribution Product (Co-finance): Risk Distribution Agreement	1. Risk Participation Agreement (guarantees) 2. Trade Finance Line of Credit 3. Soft Commodity Facility 4. Equity support	1. Guarantees issued trade finance instruments (such as letters of credit), advance payment bonds, payment guarantees, bid and performance bonds, trade-related promissory notes and bills of exchange. 2. Short-term loans to selected banks and factoring companies	Credit Guarantees and loans	GTFP provides up to 100% coverage on the country and commercial risks of individual trade-related instruments. Other trade programs include GTLP (Funded/unfunded portfolio), CCFP, GWFP (Commodity Finance), GTST (Structured Trade), Working Capital Solutions, and GTSF (Supplier Finance).	Murabaha Financing, Two-steps Murabaha Financing and Structured Trade Finance
<b>Number of transactions since commencement</b>					
21,083 (2009–2018)	1,650	21,000	1,774 (credit guarantees issued and loans disbursed)	57,000	602
<b>Value of transactions since commencement</b>					
\$36.3 billion (2009–2018)	\$6.65 billion	\$18.5 billion	\$5.9 billion supporting \$9.1 billion underlying transactions	\$64 billion	\$40.2 billion
<b>Number of corresponding banks</b>					
240	14	800	100+	1,400	n.a.
<b>Number of issuing banks</b>					
150	365	95	105	285	n.a.
<b>% of SMEs in portfolio</b>					
81%	58%	78%	84%	n.a.	15%

ADB = Asian Development Bank, AfDB = African Development Bank, CCFP = Critical Commodities Finance Program, EBRD = European Bank for Reconstruction and Development, IDB = Inter-American Development Bank, IFC = International Finance Corporation, ITFC = International Islamic Trade Finance Corporation, GTLP = Global Trade Liquidity Program, GTSF = Global Trade Supplier Finance Program, GTST = Global Structured Trade Finance Program, GWFP = Global Warehouse Finance Program, n.a. = not available, SME = small and medium-sized enterprise.

Sources: International Chamber of Commerce (2018); and ADB (2019b).

**Figure 9: Asian Development Bank's Trade Finance Program Credit Guarantee**

Source: ADB (2019c).

**Box 2: Case Studies: Asian Development Bank's Trade Finance Support in Developing Economies**

While trade has been a major driver of growth in Asia and the Pacific, several subregions have difficulty accessing international markets. Most Pacific island economies are small and rely on primary production for exports. Key barriers to trade include vulnerability to external shocks—such as volatile commodity prices and natural hazards, long distances to main trading centers (and from each other), and small domestic markets (Fairbairn 1994). Other major constraints are the shortage of development capital and infrastructure facilities. Firms wanting to export are usually constrained by lack of access to foreign exchange to purchase inputs abroad. The Asian Development Bank's (ADB) Trade Finance Program has been working to help small and medium-sized enterprises reach international markets by providing loans and guarantees to local banks to support trade. The program supports a wide range of transactions such as commodities, capital goods, and consumer products.

*continued next page*



**Box 2: Continued****Low Foreign Exchange Liquidity in Papua New Guinea and Viet Nam**

Papua New Guinea suffered a shortage of foreign currency reserves when commodity prices fell. A decrease in revenues from commodity exports decreased the foreign currency entering their market (Faber 2017a). The shortage created problems for importers sourcing production inputs, reducing firm output. This is an example where trade finance was useful. Since 2017, ADB, in partnership with a local bank, provided hard currency loans to businesses for use in international trade.<sup>a</sup>

Viet Nam also has relatively low foreign exchange liquidity. Despite an overall impressive growth rate in recent years, the trade finance gap remains wide, affecting smaller enterprises more than larger ones. Although local banks may provide loans for businesses importing and exporting, supply remains short. Also, Viet Nam's relatively low sovereign rating compared with neighbors like the Philippines and Thailand (Pokharel 2017) is another hurdle for international banks in lending foreign currency to Vietnamese banks and firms.

ADB's Trade Finance Program provides guarantees to foreign banks that lend foreign currency to the Viet Nam International Bank.<sup>b</sup> This lessens the risk they face in lending to the Viet Nam International Bank, paving the way for bigger foreign currency loans, which then increases foreign currency lending in the market. From 2009 to April 2018, the program has supported 7,624 transactions worth over \$9.1 billion (ADB 2018a).

**Financing for Capacity Expansion in Samoa**

Samoa's major cocoa export industry faces several challenges: lack of investment, damage to crops from tropical cyclones, and volatile worldwide cocoa prices (Faber 2017b). Firms (especially smaller ones) have difficulty accessing international markets because they often do not have the capacity to expand operations.

For example, the Samoan firm Savai'i Koko needed to expand operations to cater to international customers (they supply cocoa to New Zealand and Japan). As a local family-run business, Savai'i Koko has to secure financing from local banks. In 2017, ADB, in partnership with the Samoa Commercial Bank, provided a short-term export finance loan so it could meet client demand and boost operations.<sup>c</sup> The case highlights the importance of trade finance lending for small businesses that want to export, but lack financial access.

<sup>a</sup> The first ADB trade finance agreement in Papua New Guinea was with Kina Bank Limited. The trade finance facility guaranteed up to \$4 million of trade annually (ADB 2017b).

<sup>b</sup> In May 2009, ADB signed financing agreements with eight Vietnamese banks to enhance trade: Asia Commercial Bank, Military Bank, Saigon Thuong Tin Bank, Techcombank, Vietnam Bank for Agriculture and Rural Development, Vietnam Bank for Industry and Trade, Vietnam Export Import Bank, and Vietnam International Bank (ADB 2009).

<sup>c</sup> The first trade finance agreements in the Pacific were in 2016 with Samoan banks, including the National Bank of Samoa and Samoa Commercial Bank. The guarantees and loans can support trade financing up to \$12 million annually (ADB 2016b).

Sources: ADB, based on ADB (2009, 2017b, 2018a); Faber (2017a, 2017b); and Rokharel (2017).

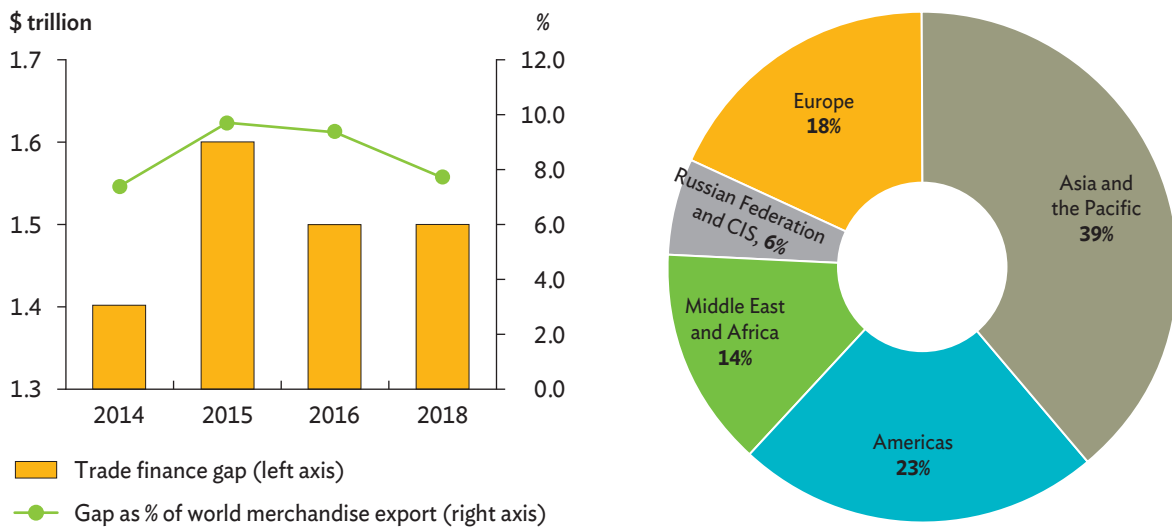
# 3

## Unmet Demand and Key Challenges in the Trade Finance Market

### 3.1 | Persistent, Large Trade Finance Gap

**Unmet demand for trade finance is persistently large.** An indicative measure of rejected trade finance applications shows a gap of about \$1.4 trillion–\$1.6 trillion, or around 8%–10% of world merchandise trade (Figure 10). Around half of global trade finance proposals originate from Asia and the Pacific, while 40% of rejected applications come from the region. The large number of proposals may reflect the region’s strong participation in the global value chain, while the high number of rejections for developing countries implies the need for more measures to promote inclusive trade.

**Figure 10: Global Trade Finance Gap, 2014–2018 and Rejection by Region, 2016**



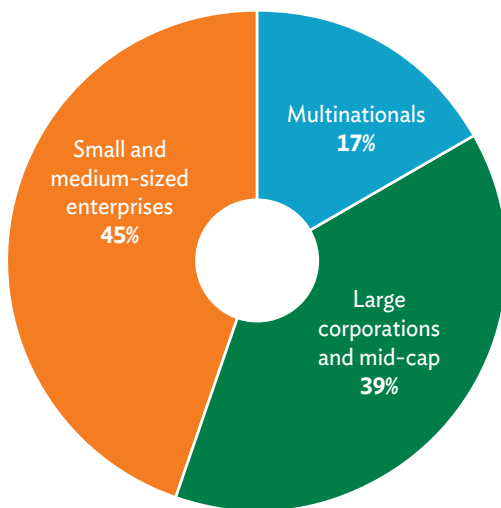
CIS = Commonwealth of Independent States.

Sources: ADB, based on ADB (2016a, 2017a, 2019a).

**SMEs are most affected as they tend to have higher rejection rates relative to larger firms.** There are higher transaction and information costs for banks dealing with smaller companies, including anti-money-laundering (AML) and/or know-your-customer (KYC) requirements and the low credit ratings of issuing banks and importers (Figure 11). High costs make it unprofitable for small businesses to use trade finance instruments such as LCs and even open account arrangements. This lack of trade financing is a significant

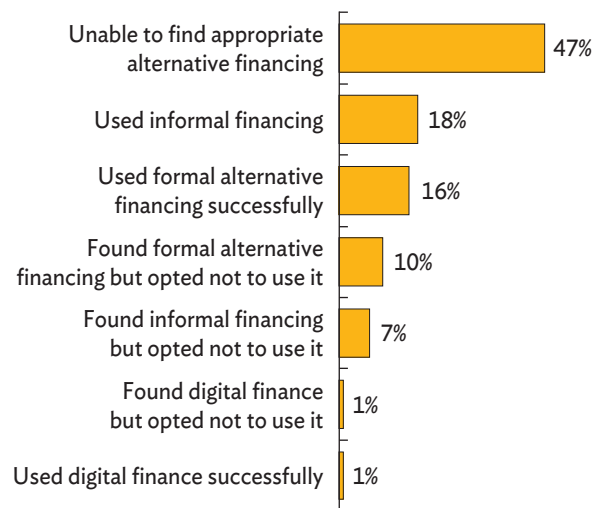
nontariff barrier to trade, particularly for SMEs in developing economies. It blocks inclusivity, as both SMEs and female-owned firms (also mostly SMEs) get left out (DiCaprio, Yao, and Simms 2017). The lack of access to trade finance could shelve trade plans altogether. The latest ADB survey (ADB 2019a) shows that around 44% of firms with rejected trade finance applications were unable to find appropriate alternative financing (Figure 12). Overall access to finance is indeed a significant factor in SME growth and participation in global value chains (Box 3).

**Figure 11: Trade Finance Rejections by Firm Size, 2018**



Source: ADB (2019a).

**Figure 12: Possibility of Finding Alternative Sources of Trade Finance**



Source: ADB (2019a).

### Box 3: Empirical Assessment on the Impact of Access to Finance for Small and Medium-Sized Enterprises

Using small and medium-sized enterprise (SME) data from 139 countries from the World Bank Enterprise Surveys during 2006–2018, firm-level regressions are conducted to gauge the impact of access to finance on firm growth and exports.<sup>a</sup> As dependent variables, annual growth for sales and employment are used to measure firm growth, and a dummy variable for being an exporter.<sup>b</sup> The explanatory variables include availability and use of finance (1 for firms that have an outstanding loan, and 0 otherwise), firm level characteristics (size, whether the firm is a standalone establishment, ownership [foreign or government owned], industry [manufacturing versus services], and age), and country level variables (inflation and gross domestic product growth).

<sup>a</sup> In this study SMEs in developing countries are defined as firms with less than 100 employees.

<sup>b</sup> Exporter dummy equals 1 if the firm reports at least 10% of its sales being exported directly or indirectly (sold domestically to third parties that export products) and 0 otherwise.

**Box 3: Continued**

Estimation results show that SMEs access to external finance is positively associated not only with positive firm outcomes for SMEs such as increased sales growth and employment, but also with SME participation in global export markets. Access to a loan is associated with SMEs growing (i) sales at a rate 1.3 percentage points higher, and (ii) employment at a rate of 0.9 percentage points higher than those with no access. SMEs with access to a loan are (iii) 2.7% more likely to be exporters. Similar results are found if the samples are restricted to only developing Asia.<sup>c</sup>

**Access to Finance, Firm Performance and Participation in Export Markets for SMEs**

	Sales Growth	Sales growth –Developing Asia	Employment Growth	Emp growth –Developing Asia	Exporter	Exporter growth –Developing Asia
Access to loan	0.013*** (0.004)	0.016* (0.009)	0.009*** (0.002)	0.008** (0.004)	0.027*** (0.004)	0.029*** (0.007)
Log(Employment)	0.012*** (0.002)	0.007** (0.003)	0.019*** (0.002)	0.014*** (0.004)	0.054*** (0.004)	0.052*** (0.005)
Log(Age)	-0.051*** (0.005)	-0.038*** (0.008)	-0.047*** (0.004)	-0.030*** (0.006)	0.002 (0.002)	0.007 (0.005)
Manufacturing	-0.002 (0.003)	-0.004 (0.007)	-0.011*** (0.002)	-0.017*** (0.003)	0.089*** (0.009)	0.068*** (0.014)
Foreign ownership	-0.000 (0.000)	-0.000 (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.002*** (0.000)	0.002*** (0.001)
State ownership	-0.000 (0.000)	-0.000 (0.000)	-0.000* (0.000)	-0.000 (0.000)	0.001 (0.001)	-0.001** (0.000)
Single establishment	-0.003 (0.004)	-0.012** (0.005)	0.002 (0.002)	-0.001 (0.003)	-0.015*** (0.006)	-0.037*** (0.008)
Inflation	0.000** (0.000)	0.000** (0.000)	-0.000 (0.000)	0.000*** (0.000)	-0.000 (0.000)	-0.000 (0.000)
GDP growth	-0.000 (0.004)	-0.007* (0.004)	0.001 (0.001)	0.001 (0.002)	0.002 (0.002)	0.004 (0.005)
Fixed effects	-----Country, Year-----					
N	73,333	21,705	90,618	25,190	100,319	26,949
Adj. R-sq	0.112	0.078	0.090	0.057	0.113	0.096

Notes: Standard errors are clustered by country; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

<sup>c</sup> Developing Asia includes 32 countries among ADB developing member countries.

Source: Ayyagari and Kim (2019) using data from 2006–2018 World Bank Enterprise Surveys.

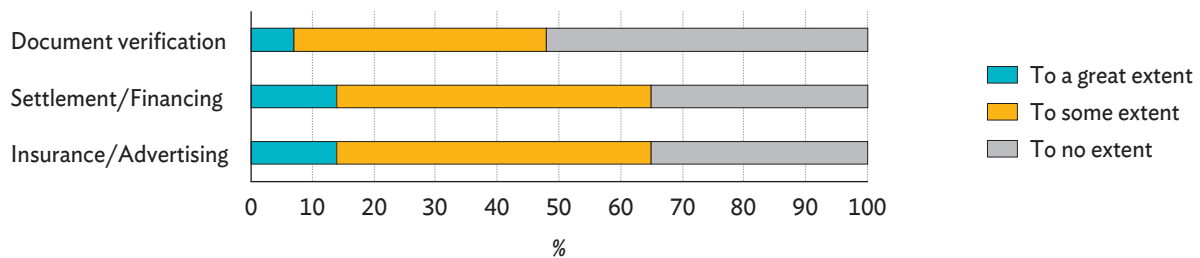
## 3.2 | Three Major Challenges in the Trade Finance Market

### 3.2.1 Process inefficiency

**Part of the process inefficiency in trade finance is continued use of paper in documentary transactions.**

Document handling is the main cost of trade finance. For example, the process flow for a traditional LC shows that many parts of the process involve documents to verify the legitimacy of a trade transaction.<sup>23</sup> As such, LCs are involved with redundant document examination in every information exchange and transmission: more than 20 parties are involved in the process and more than 100 pages in 10 to 20 documents, many transmitted multiple times (Boston Consulting Group 2018).<sup>24</sup> In fact, the majority of banks surveyed in the ICC 2018 Survey removed paper to some extent or have implemented some change (Figure 13). It is most notable in document verification—more than half of the responding banks depend solely on paper for documentary transactions.

**Figure 13: Degree to Which Banks Implement Removal of Physical Paper for Documentary Transactions**



Source: International Chamber of Commerce (2018).

**Paper-based procedures, such as traditional LCs, can lead to multiple potential risks.** Manual processing and handling are the prime culprits in many delayed payment or nonpayment problems (American Express FX International Payments 2015; PYMNTS 2015). Paper-based processes in trade finance transactions may also increase the risk of financial fraud as only document validation is required to move to the next procedure (Box 4). Other challenges in using LCs include complicated and long procedures, high bank commissions, and processing delays due to late arrival of related documents (Özkan et al. 2014) (Figure 14).

<sup>23</sup> The initial use of traditional LCs dates back to the early 1900s (Mead 1922), a time where international trade took months to initiate, implement, and conclude. Buyers and sellers coming from different countries had few ways to know who they were trading with, and needed a way to minimize the risks involved, resulting in the use of LCs. In this period, the pace of work flow was as slow as trade itself.

<sup>24</sup> The cross-border movement of goods involves multiple documents—including a commercial invoice, packing list, booking confirmation, purchase order, bill of lading, dangerous goods declaration, import and export declarations, certificate of origin, inspection certificate, and insurance certificate (TradeLens n.d.). Throughout a traditional LC transaction, several types of fees are paid by either applicants or beneficiaries, contributing to a perception that LCs are expensive. Major fees include issuance, advising and confirmation fee, amendment fee (when the LC is amended), discrepancy fee (when discrepant documents are presented), reimbursement fee (when setting the credit amount between issuing and conforming banks), and other handling fees (such as the cost of sending SWIFT messages and document holding, among others) (Eker 2018).

**Box 4: Fraudulent Activities in Trade Finance Transactions**

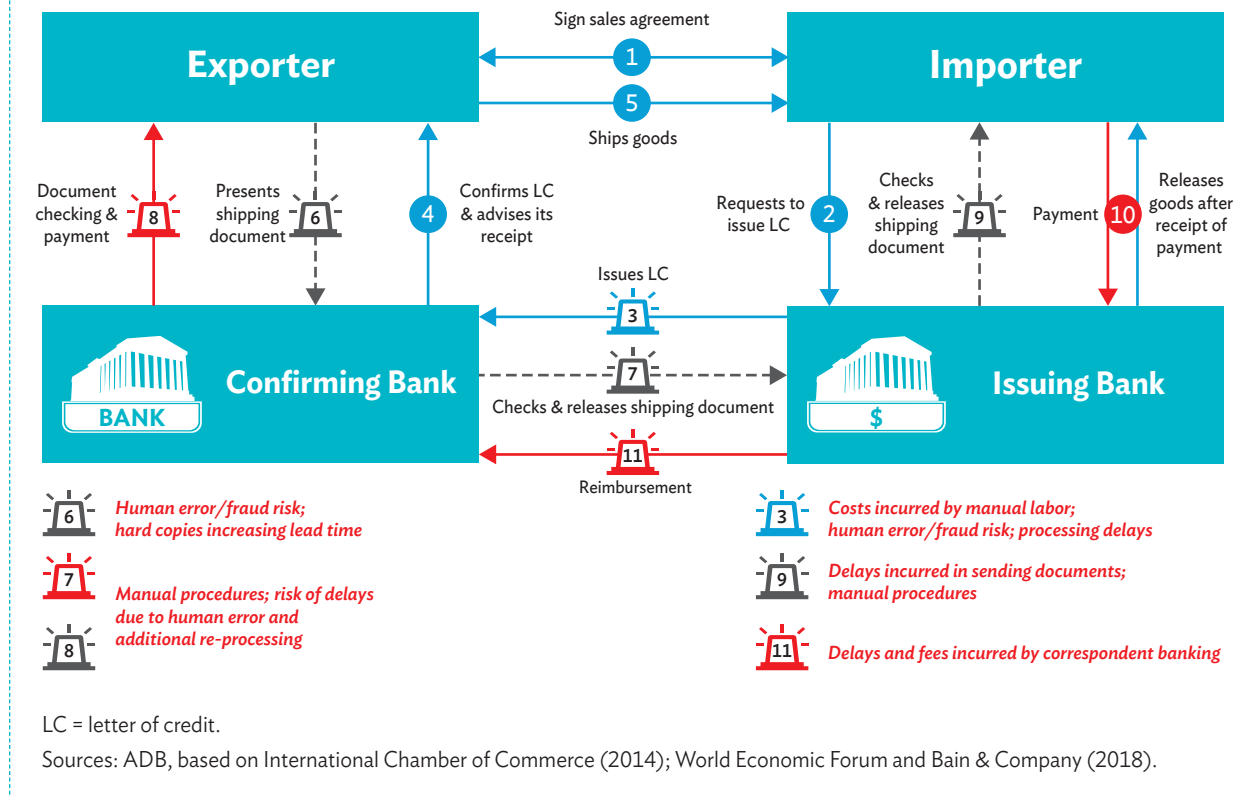
International trade, given its large values and volumes, can attract fraud and money laundering. In trade finance, money laundering usually involves a fraudster trying to defraud a bank or the buyer of a consignment of freely traded commodities such as oil. The letter of credit (LC) lists documents that should be provided by the importer that are then verified by the negotiating bank. These documents should be exactly as the LC from the issuing bank states with no discrepancies. When all is in order, the exporter is paid by the negotiating bank while the issuing bank reimburses the payment. Providing the documents is the only basis for payment—when paying the beneficiary (the exporter) of the transaction “money against documents” matters rather than “money against goods.” The risk of fraud thus arises where only valid documents are needed.

Two types of fraud are particularly prevalent: (i) presenting a fraudulent document or (ii) when both buyer and seller collude to defraud banks using an LC. LCs, however, operate under a well-defined structure of the Uniform Customs and Practices (International Chamber of Commerce 500), where parties know their rights and obligations in the contracts involved. As such, LCs are less prone to fraud compared to other financial instruments, such as promissory notes, certificates of deposits, Eurobonds, and others, which are not subject to an internationally recognized set of rules. Moreover, transactions based on forfaiting—selling of receivables at a discount in return for immediate funds—as well as trading forfeited financial instruments in secondary markets, are also fraud risks. As financial instruments are traded in these markets, each party funding the transaction moves farther away from the original transaction and weakens due diligence. These instruments are also traded on a nonrecourse basis, where parties cannot refer back to the original transaction for their claims.

In a study of fraud through interviews with bank officials in Malaysia, CheHashim and Mahdzan (2014) found that LC-related fraud accounts for about 70% of total documentary fraud, while the other main types are container and insurance fraud. Under LC documentary fraud, 45% of bankers noted that forging bills of lading was most common. Based on the practice that banks honor payment to the seller upon full compliance of LC requirements, the study found that banks adhere to the Uniform Customs and Practice for Documentary Credits guidelines, given the difficulty of proving that documents are falsified or verifying if substandard goods are being transacted.

Sources: ADB, based on Palmer (2001); CheHashim and Mahdzan (2014).

**Paper-based, manual processes remain widespread in trade finance transactions, even though they are time consuming and prone to delay and human error.** According to ICC (2018), paper is still widely used in documentary transactions, with 35% of respondent banks saying that paper continues to play a role in the initiation and settlement stages of transactions, and 52% admitting that no solution has been implemented for document verification. Though banks have been trying to reduce costs associated with trade financing operations for decades, operational costs still consume roughly 50%–60% of the price charged to clients. The remainder of the price covers other items such as risk and capital costs (World Economic Forum and Bain & Company 2018).

**Figure 14: Risks in Letter of Credit Transactions**

**Digitalized letters of credit have existed since the early 1990s; but the main obstacle to their wider application is the lack of a streamlined process to validate digitalized documents.** Previous attempts to digitalize trade finance documentation have only included portions of entire process (Ganesh et al. 2018; Barnes and Byrne 2001). For example, LC issuance records may be already in electronic form. Yet, it remains difficult to process electronic forms until many of the documents required, often still on paper, are validated in subsequent processes.

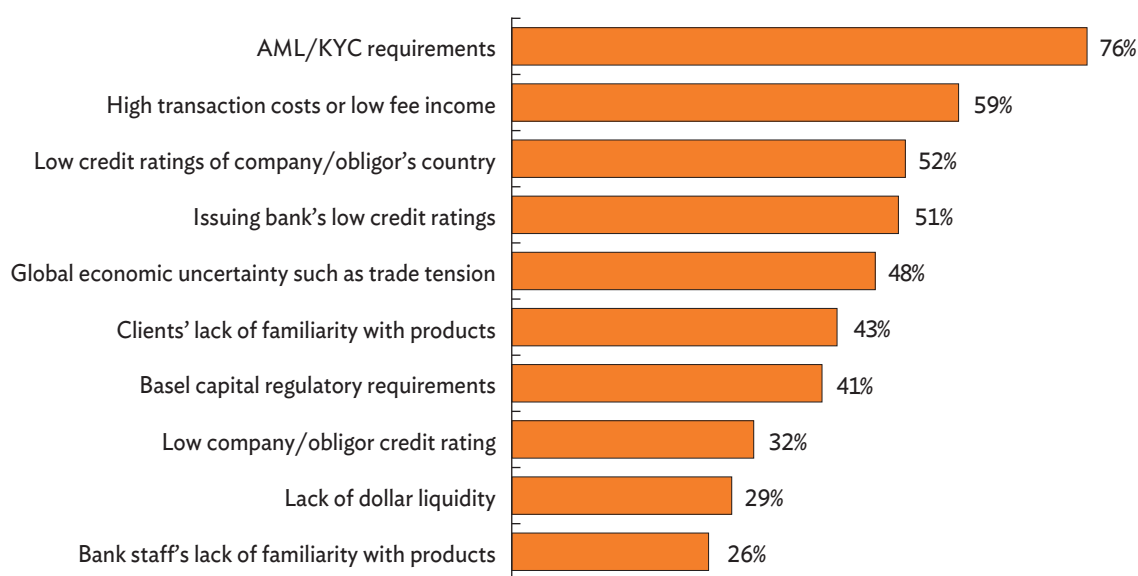
### 3.2.2 Regulatory requirements

#### *Know-Your-Customer, Anti-Money-Laundering, and Combating the Financing of Terrorism*

**Financial institutions are required to conduct significant due diligence.** Regulators try to prevent the use of the trade finance system as a conduit for crime and terrorism financing, and money laundering (Deloitte 2018; Taafe 2018). Following the global financial crisis, compliance and regulatory requirements have increased significantly for banks, including trade finance. This is related to their own clients or counterparties to prevent fraud and avoid losses under KYC regulations, along with AML and combating the financing of terrorism (CFT). Banks must be able to identify the ultimate beneficiary of a transaction to ensure it is not tied to illicit activities.

**Regulatory compliance increases a bank's cost of supplying trade financing.** A majority of banks perceive regulatory and compliance requirements as obstacles to industry growth (Figure 15). Compliance with AML and/or KYC is indeed intensive, with documentation to verify the identity and source of funds, which can involve significant costs for both financial institutions and clients (Box 5). On top of the global requirements, jurisdiction-specific requirements add more compliance burdens. For example, foreign financial institutions in the US face more stringent US regulations since the 11 September 2001 terrorist attacks, often leading to significant penalties. Identifying suspicious transactions need both quantitative and qualitative criteria, which requires human and information and communication technology resources (Arner et al. 2017). Compliance accounts for up to 25% of servicing capacity, according to the Boston Consulting Group's experience (Dab et al. 2016).

**Figure 15: Obstacles and Concerns in Trade Finance Growth**  
(% respondents agreeing on barriers to trade finance)



AML = anti-money-laundering, KYC = know-your-customer.

Note: Based on the surveyed banks' responses.

Source: ADB (2019a).



### Box 5: Know-Your-Customer Compliance Costs and Client Onboarding Time

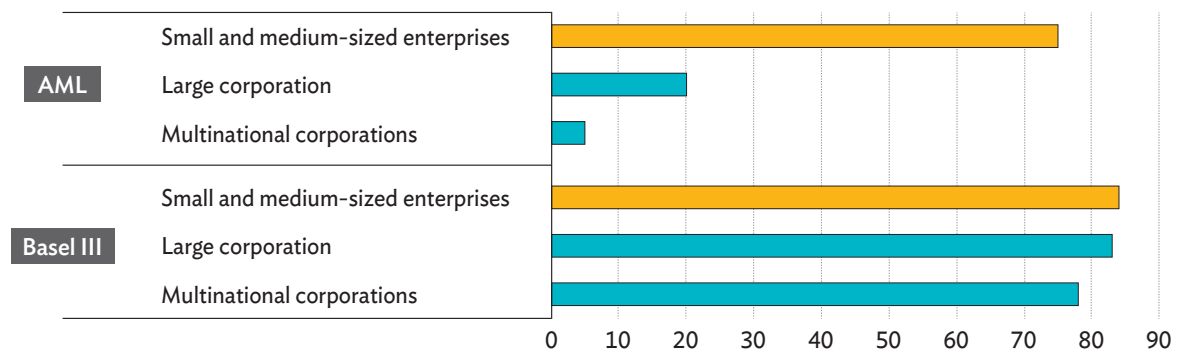
The Thomson Reuters 2017 Global KYC Survey surveyed 1,023 financial institutions and 1,123 corporations in April and May 2017 on the costs of KYC compliance and record-keeping. The results show that financial institutions with \$10 billion or more in revenue spent \$150 million in 2017 on these procedures, up from \$142 million in 2016. In conjunction, the survey notes deployed employees rose to an average 307 KYC compliance professionals in 2017 from 68 in 2016. Despite the additional costs, client onboarding time still increased to 26 days in 2017, up from 24 days in 2016. In addition, respondents expected that processing time increased again in 2018. Financial firms and corporations cited continuing KYC regulatory changes worldwide as being the biggest driver affecting compliance processes, with changes in KYC regulation leading them to constantly update customer records to stay compliant.

KYC = know-your-customer.

Source: Thomson Reuters (2017).

**SMEs bear a disproportionate regulatory burden, particularly AML.** While all firms bear the higher costs of bank regulation, it is more pronounced among SMEs—which have much lower assets and collateral to apply for loans, and are thus considered a higher risk for banks than larger firms (Figure 16). An unintended consequence of these regulations is that, instead of managing risks on a case-by-case basis, banks avoid risk altogether by cutting off banking relationships in high-risk jurisdictions or avoiding trade finance lending to firms with higher risk profiles (Nicholls 2016). Moreover, higher AML/KYC monitoring means higher costs, which often outweigh the profitability from these transactions.

**Figure 16: Expected Impact of Regulatory Requirements (%)**



AML = anti-money-laundering.

Note: Based on the surveyed banks' responses.

Source: ADB (2016a).

### Basel III

**The shift to Basel III in response to the 2008/09 global financial crisis required banks to boost regulatory capital and comply with new requirements on liquidity.** While stricter standards enhance transparency and financial stability among banks, they also raise the cost of financial intermediation and limit the availability of bank credit.<sup>25</sup> Along with AML/KYC requirements, the Basel III has been blamed in part to the declining trend in cross-border bank loans to emerging economies (Rojas-Suarez 2018). The increased costs of regulatory requirements on trade financing effectively made the network of correspondent banks shrink, with global banks reporting an 11% reduction of trade financing in high-risk markets between 2014 and 2015 (ICC 2018). Risk-weighted assets in particular played a role in shifting attention from international to domestic markets (Lasaga 2016; Deloitte 2018), as well as from riskier SMEs to safer assets such as treasury bonds (Zausner 2017).

**Concerted efforts among regulators, international organizations, and trade finance stakeholders have helped mitigate the unintended damage Basel III had on trade finance in developing economies.**

A series of surveys after the global financial crisis provided some official data to better understand trade finance markets.<sup>26</sup> In particular, ADB and the ICC launched the ICC Trade Register Report in 2010 to provide global data-gathering and analysis of the risk profile of trade finance. It showed that the short tenor of trade transactions, low default across all product types, and relatively few defaults throughout global economic downturn implied trade finance was actually low risk (ICC 2010). At the request of the G20, discussions held between the World Bank with the WTO and the Basel Committee on Banking Supervision have led to changes in the Basel III requirements for trade finance (WTO 2016) (Box 6).

### 3.2.3 Information asymmetry

**Sellers and buyers of goods or services have little incentive to fully disclose information when they benefit from withholding information.** For example, sellers may not disclose the poor quality of their products, while buyers may pretend they do not want to pay. In the credit market, a borrowing firm knows more about its ability to pay back loans and its future performance capability than its financiers. That is the basis of asymmetric information. Banks charge a risk premium to compensate. However, the higher interest rates charged to risky clients become a disincentive to accurately disclose their risk profiles. As banks know of this possibility, they usually look at a borrower's credit history. But this is still limited information compared with what the borrower actually knows about his financial situation (Tarver 2018).

<sup>25</sup> The first principles of the Basel Accord were agreed upon in 1988, and further revised in 2004 (Basel II). Basel III sets out voluntary regulatory standards on bank capital adequacy, stress testing, and market liquidity that must be implemented by 2019 (ADB 2015).

<sup>26</sup> International Monetary Fund/Bankers Association for Finance and Trade-International Financial Services Association conducted six trade finance surveys from 2008 to 2011: four surveys between December 2008 and March 2010, the fifth in October 2010 and; sixth in August 2011. ICC's *Global Trade Finance Survey* began in 2009 and continued annually. ADB's *Trade Finance Gaps, Growth, and Jobs Survey* began annually in 2013, biennially since 2017.

### Box 6: Major Basel III Changes on Trade Finance

While Basel III was designed to strengthen prudential supervision and enhance transparency, the initial capital and liquidity requirements did not fully consider the low risk of trade finance products. The following measures were taken by the Basel Committee to properly reflect the lower risk profile of trade finance in relevant regulatory requirements:

- **Measure on maturity and sovereign floors (2011):** Under advanced internal ratings-based approaches, a 1-year maturity floor was set for trade finance products in calculating risk-weighted assets, despite the 90 day average tenor for trade finance products.<sup>a</sup> In 2011, the maturity floor was waived, along with a sovereign floor that discriminated against unrated banks (Malesova 2016). The sovereign floor suggests that trade finance products such as letters of credit may carry an unduly higher risk weight, especially for developing countries. This arises from the practice that bank instruments cannot carry a higher rating than the sovereign rating under which the bank is incorporated (Thieffry 2016).
- **Measure of liquidity coverage ratio (2013):** The liquidity coverage ratio under Basel III set the assumed outflow (runoff) rate for trade finance products under national discretion (5% up to 100%).<sup>b</sup> In 2013, this was capped at 0%–5%, although still subject to national discretion (Malesova 2016).
- **Measure of leverage ratio and net stable funding ratio (2014):** In calculating the leverage ratio, the credit conversion factor used to convert off-balance to on-balance items was set at 100%.<sup>c</sup> In 2014, the Basel Committee lowered it to 20% for short-term self-liquidating letters of credit and 50% for other instruments. The required stable funding factor for short-term lending to small and medium-sized enterprises (under the net stable funding ratio),<sup>d</sup> initially set at 85%, was also subsequently reduced to 50%.

<sup>a</sup> Under Basel III, minimum capital ratio (capital/risk-weighted assets) is 8%.

<sup>b</sup> Minimum liquidity coverage ratio = (High-quality liquidity assets/30-day net cash outflow) ≥ 100%

<sup>c</sup> Minimum leverage ratio for Tier 1 capital = (Tier 1 capital/total assets) ≥ 3%

<sup>d</sup> Minimum net stable funding ratio = (Available amount of stable funding/required amount of stable funding) ≥ 100%

Sources: ADB, based on World Trade Organization (2016), Bank for International Settlements (2014), and Malesova (2016).

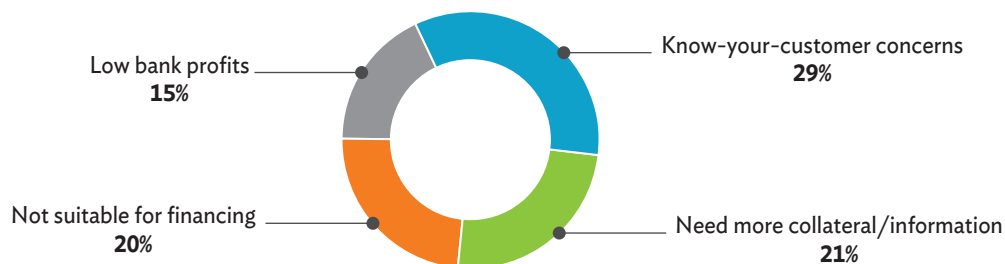
### Information asymmetry gives rise to two major problems: (i) adverse selection and (ii) moral hazard.

Adverse selection, in the case of credit markets, is the unintended result when privately held information harms “good” borrowers. As banks might want to simplify their loan pricing structures by offering an “average interest rate,” “bad” (risky) borrowers will likely end up getting a loan, while “good” borrowers will look for funding elsewhere, leaving only the bad borrowers in the market (Cecchetti and Schoenholtz 2017). Moral hazard, on the other hand, is the risk that the borrower will not use his loan as originally intended. This poses a problem to the lender as the borrower may engage in riskier activities or misuse of funds, increasing the chances the borrower will default on the loan.

**Information asymmetry in credit markets comes more from borrowers than lenders.** There are times when borrowers know beforehand they have a high probability of defaulting on a loan (called hidden information), while other times, high interest rates induce them to default on their loans due to high payback costs (called hidden action) (Karlan and Zinman 2009). This kind of information, however, could be costly to obtain and, coupled with high transaction costs, become prohibitive in SME transactions (WTO 2016; Deloitte 2018). When banks better understand the pressures facing their borrowers, it becomes possible for lenders to design programs that increase the likelihood of repayment.

**While banks require knowledge of their clients to mitigate information asymmetry, the requirements may prevent SMEs from accessing finance.** Banks generally consider three factors in determining whether to grant loans: the relationship factor (“soft information”), the financial statement factor (“hard information”), and the collateral and guarantee factor (Uchida 2011). However, SMEs without eligible collateral or soft and hard information are more likely to have their trade finance applications rejected (Figure 17). And these SMEs could give up and not search for alternative sources of funding, leading to failed transactions (ADB 2017a).

**Figure 17: Reasons Banks Reject Trade Finance Applications (% of rejections)**



Source: ADB (2017a).

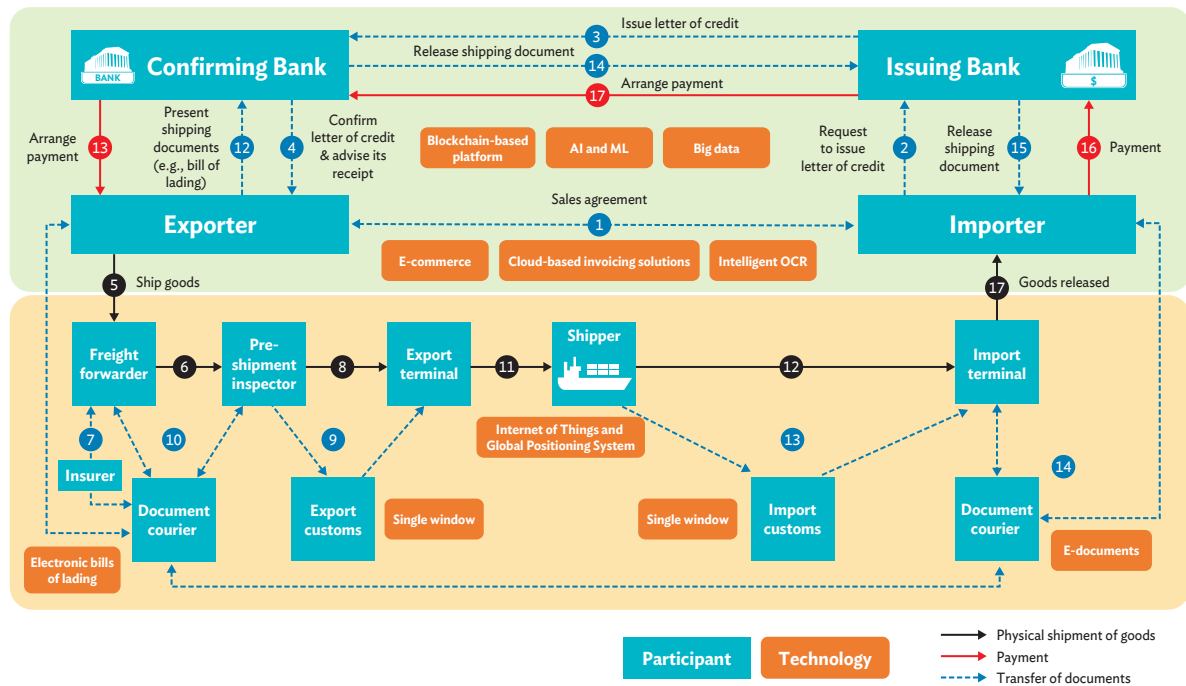
**Alternative credit scoring using nonfinancial transactions—and establishing a credit risk database—can help reduce the information gap between SME borrowers and lenders.** For instance, a lender may analyze an SME’s online sales to assess its ability to repay a loan, or use data from utilities and telecommunications companies to determine a borrower’s history of paying bills on time (Creehan 2018). In 2015, the People’s Bank of China issued provisional licenses to eight firms (including fintech firms associated with Alibaba, Tencent, and Ping An) to establish credit scoring services that use alternative data to raise access to financial products. The Japan Risk Data Bank, established in 2000 as the country’s first data consortium—covering 70% of Japanese banks (and all major banks)—launched a rating service for unlisted SMEs as a joint project with Standard & Poor’s. Similarly, Japan’s Credit Risk Database, established in 2001, uses information shared among its members on SME borrowers’ financial history to assess credit risk. As of March 2019, Credit Risk Database included information on 2.5 million incorporated SMEs and 1.3 million sole-proprietor SMEs (Credit Risk Database web page).

# 4

## Opportunities in Trade Finance: The Role of Technology

**N**ew technologies can significantly improve SME access to trade finance. SMEs are usually burdened by high interest rates and collateral requirements, while banks are discouraged by the high cost of regulatory compliance. Technologies can help cut costs, eliminate manual documentation, and enable accumulated digital information on SME profiles for lenders to assess risk. They offer a more efficient, decentralized approach to financial services that may benefit SMEs, especially those underserved by traditional banks. Some of these emerging technologies include distributed ledger technology (blockchain), artificial intelligence (AI), and machine learning (see Annex 3 for examples and benefits). While technology is increasingly being used in today’s physical supply chain, within trade finance or financial supply chains it can offer solutions that substantially improve efficiencies across the lending process and draw more SMEs into the system (Figure 18).

**Figure 18: Trade Flows and Technologies**



AI = artificial intelligence, ML = machine learning, OCR = optical character recognition.

Sources: ADB, based on ADB (2018b); International Chamber of Commerce (2014, 2018); and Simmons and Simmons (2015).

## 4.1 | Potential and Progress

**Fintech is giving rise to an array of applications in financial services—such as payments, financing, asset management, insurance, and financial advice.** In trade finance, for example, electronic bills of lading and other e-documents can greatly reduce paperwork and facilitate transactions with customs (Table 4). E-commerce platforms and cloud-based invoicing allow direct transactions between buyers and sellers. Distributed ledger (including blockchain) technology and AI can facilitate due diligence and payments for SMEs having difficulty finding representative banks.<sup>27</sup> Fintech leverages mobile internet access, cryptography, AI, and big data to improve access and reduce the costs of financial services.

**Table 4: Technology and Financial Services in Trade Finance**

Technology	Financial Services in Trade Finance			
	Payment	Lending	Document check	Compliance check
Cloud-based invoicing	cross-border online filing and payment			
Electronic bills of lading, optical character recognition			faster, acceptable form for tax and customs	
AI, machine learning, big data	(automated) credit decisions			
	RegTech, fraud detection, efficient and accurate KYC			
Distributed ledger	secured payment & transfers			
	traceable, transparent, and efficient blockchain-based LC platform; smart contract			
API; digital wallet	digital funding/investment channels such as P2P and crowdfunding			
	interoperability between platforms; expandability to third-party developers			

AI = artificial intelligence, LC = letter of credit, KYC = know-your-customer, RegTech = regulatory technology, API = application programming interface.

Sources: ADB, based on International Monetary Fund (2017), World Economic Forum and Bain & Company (2018).

**These technologies help address process inefficiency, regulatory compliance, and information asymmetry—the trade finance market’s three main challenges.** These technologies significantly reduce process inefficiency by decreasing human error and enabling faster transactions (Table 5). Distributed ledger technology, AI, and big data can lead to greater flexibility in complying with changes in regulatory requirements and market conditions. Fintech firms using big data coupled with AI can mitigate the problem of asymmetric information by providing nontraditional alternate credit data and enable more efficient KYC requirements.

<sup>27</sup> Digital ledger and blockchain technology are similar in that both are digitized books of record. In general, a digital ledger could be any decentralized digital database managed by various contributors without an arbiter or mediator (ensuring transparency) (BBVA 2018). A blockchain is a specific digital ledger technology comprised of “blocks” linked using cryptography (Blockgeeks 2019). Other examples of digital ledger technologies include hashgraphs, directed acyclic graph, and holochains (Khan 2019).

**Table 5: Potential Benefits of Available Technology**

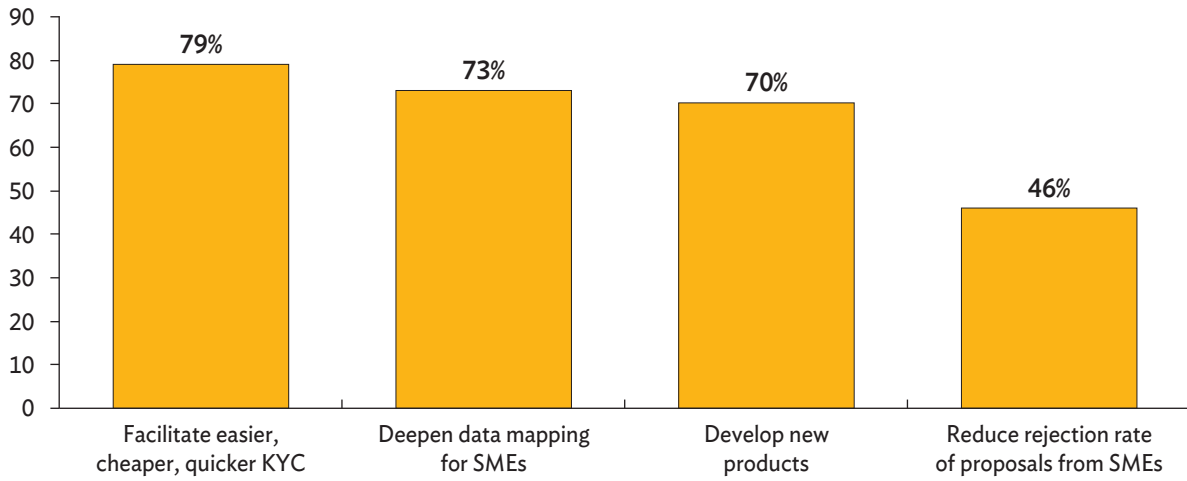
Technology	Addressing Challenges of Trade Finance				
	Challenge 1: Process inefficiency		Challenge 2: Regulatory requirements		Challenge 3: Information asymmetry
	Decreased human errors	Improved speed of transactions	Improved flexibility to changes in market and/or regulatory requirements	Improved KYC and AML efforts	Improved credit scoring tools
Cloud-based invoicing solutions	✓	✓			✓
Optical character recognition	✓	✓		✓	
Electronic bills of lading	✓	✓			
Distributed ledger technology such as blockchain-based platforms	✓		✓	✓	✓
Artificial intelligence and big data	✓	✓	✓	✓	✓
Single window	✓	✓	✓		
Internet-of-things and GPS	✓	✓			
Application programming interfaces	✓	✓	✓		

AML = anti-money-laundering, GPS = global positioning system, KYC = know-your-customer.

Source: ADB compilation.

**Digitalization and automation may help address some long-standing issues in trade finance, such as high transaction processing costs and costly KYC procedures.** Digitalized trade information can reduce costs, as it streamlines operations, lowers client onboarding costs, and facilitates instant compliance checks with AML and international sanctions. Also, technology can lower the fixed costs of operations and improve internetwork operability among institutions (He et al. 2017). Among the uses of fintech, a large share of banks surveyed in ADB (2019a) expects better KYC checks and reduced due diligence costs (Figure 19). The estimated cost reduction could reach \$2.5 billion–\$6 billion over 3 to 5 years (ICC 2017). For nonbank players, like ECAs and forfaitors, digital platforms and solutions can be efficient cost-saving tools that enable them to acquire credit information and thus automate underwriting decisions (Figure 20) (ADB 2019a).

**Figure 19: Technology’s Effects on Bank’s Ability to Conduct More Transactions**

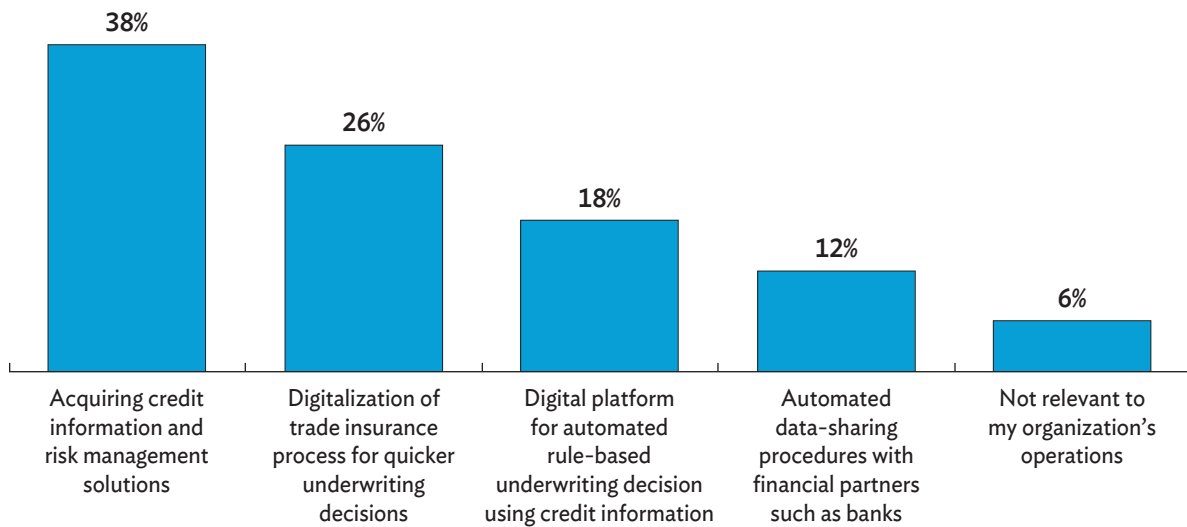


KYC = know-your-customer, SMEs = small and medium-sized enterprises.

Note: Percent of responding banks that agree on the effect of fintech and digitalization on banks and SMEs.

Source: ADB (2019a).

**Figure 20: Use of Technology by Export Credit Agencies**



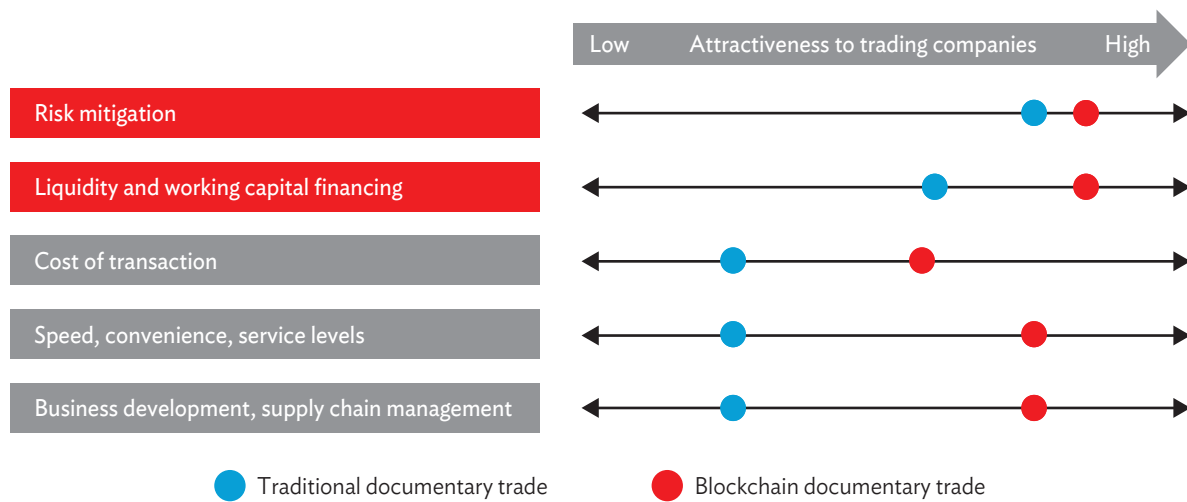
Source: ADB (2019a).



**Blockchain technology**

**Blockchain technology is a digital platform that allows banks to create an accurate and immutable record of each transaction—and exchange reliable trade information digitally.** Blockchain-based trade finance platforms may greatly benefit trade finance stakeholders. When powered by a blockchain-based platform, document trade—such as an LC—holds many advantages over traditional processes, including process efficiency, risk mitigation, managing working capital, and supply chain management (Figure 21). In addition, digital ledger technology can address key barriers such as KYC and AML issues as a client’s vital information can be securely shared among the client’s banks (Moyano and Ross 2017).

**Figure 21: Advantages of Blockchain Documentary Trade over Traditional Processes**



Source: Ganesh et al (2018).

**Digital Trade Finance Solutions Using Blockchain Technology and Smart Contracts**

**Global banks and large traders, in collaboration with information technology solution showcased pilot tests for blockchain-based trade finance transactions over the past 3 to 4 years.** The four largest consortia alone (Voltron, Marco Polo, we.trade, and eTradeConnect [formerly Hong Kong Trade Finance Platform]) already have at least 50 participating banks globally, with more expected to join (Disruption Banking Website 2018, Finextra 2019) (Table 6).<sup>28</sup>

For instance, the Voltron blockchain platform aims to digitalize the process for LCs. It was founded by a consortium of eight banks—Bangkok Bank, BNP Paribas, CTBC Holding, HSBC, ING, NatWest, Skandinaviska Enskilda Banken (SEB), and Standard Chartered (Wass 2019d). The project reached a milestone in 2018 when HSBC and ING used the platform for Cargill’s agricultural conglomerate to conduct

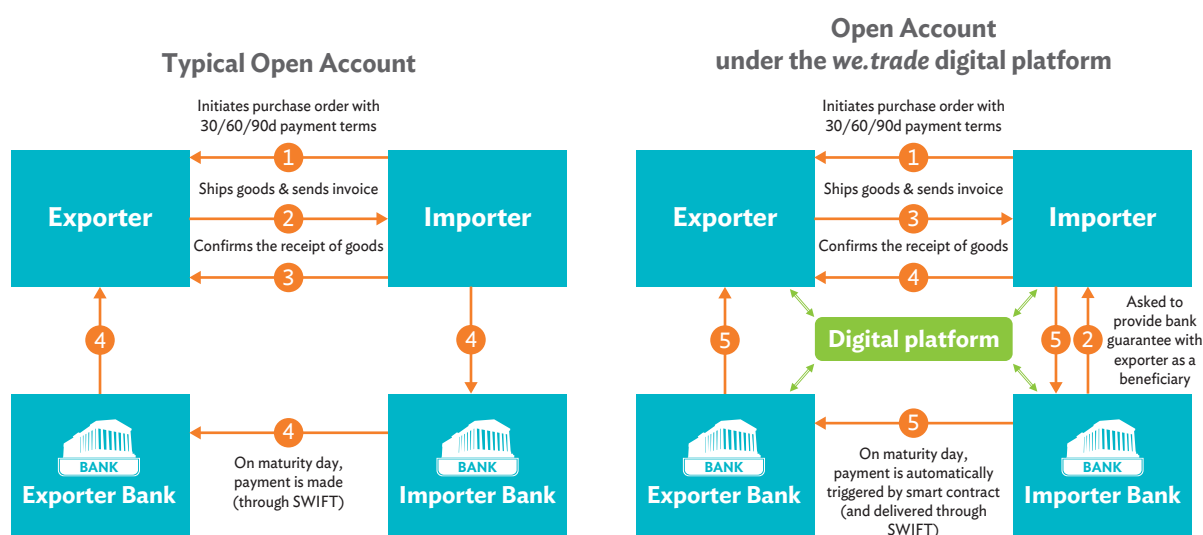
<sup>28</sup> Batavia also used to be a major consortium, but merged with we.trade in 2018 (Wass 2018b).

the first live, commercial trade finance transaction from buyer to seller, reducing the processing time from the standard 5–10 days to just 24 hours. Similarly, we.trade is a digital solution for managing, tracking, and protecting open account trade transactions between SMEs in Europe. Built by IBM and powered by Hyperledger Fabric, the platform enables full visibility of the entire process from order creation to payment execution (Wass 2019c).

While it will take time before digital trade finance platforms are fully operational for a wider swathe of customers—as many new functions continue to be developed—tests have convinced stakeholders to believe the new platform will significantly change in the trade finance market.

**A digital platform with smart contracts on automated workflow can facilitate international trade by providing a simple and secure platform for banks and clients.** For example, we.trade, a digital platform for open account transactions, offers exporters and importers access to a simple user-interface where they can easily create trade orders online, manage the entire trade process from order to payment (users may track and trace orders with over 400 couriers), and select banking products, settlement conditions (an event-based automatic payment is triggered through smart contracts), and payment terms (Figure 22). For risk mitigation, clients using the platform undergo a KYC process, while banks enter the Bank Payment Undertaking so counterparty risk is transferred to the bank.<sup>29</sup>

**Figure 22: Open Account: Traditional versus Digital Platforms**



Note: For a typical open account, if an exporter is concerned about the creditworthiness of the importer, it can purchase risk-mitigating products such as export credit insurance. Using the digital platform, shipment tracking is provided; (optional) the exporter can ask its bank to provide invoice financing (for example, forfaiting) prior to maturity before Step 5. In this case, the importer bank directly pays the exporter bank on the due date.

Sources: ADB, based on Simmons and Simmons (2015); Morris (2018); we.trade website n.d.

<sup>29</sup> The Bank Payment Undertaking is issued in favor of the seller and constitutes an “irrevocable and absolute undertaking by the bank to make a payment directly to the seller, following the satisfaction of the settlement conditions defined in the smart contract” (we.trade website n.d.).

**Table 6: Blockchain-Based Trade Finance Applications**

Transaction	Applications	Cases
Letter of credit	<b>Voltron</b> (built on R3's Corda blockchain)	HSBC and ING used the platform to conduct their first live, commercial trade finance transaction together with trading giant Cargill, which saw transaction time being reduced from a standard 5–10 days, to just 24 hours (May 2018; Wass 2019d).
Blockchain-based electronic bills of lading	<b>Wave</b> (fintech startup that went through Barclays' accelerator program in 2015)	In 2017, Wave supported a transaction involving shipment of products from the People's Republic of China (PRC) to Canada (together with Israeli shipping company ZIM and logistics firm Sparx Logistics) and noted a hitch-free delivery of the goods to the consignees (Pimentel 2017).
Open account	<b>we.trade</b> (built on the IBM Blockchain Platform using Hyperledger Fabric)	The trade with Nordea Bank in Finland involved the United Kingdom-based company Fluid Pumps, which used the platform to complete an open account sale with GPS Food Group in Finland, supported by a bank payment undertaking (March 2018; Wass 2018a). UniCredit in Italy and KBC Bank in Belgium have used the platform to facilitate a tinplate trade between metal packaging producer Gruppo ASA and its supplier, Steelforce (March 2019; Wass 2019c).
Open account	<b>Marco polo</b> (built on Corda; integrated with the TradelX Platform)	Two commercial transactions between the international technology group Voith, and the leading pump and valve manufacturer KSB SE were mapped. One transaction involved the delivery of special hydraulic couplings from Germany to the PRC and the other the delivery of pumps within Germany (March 2019; Marco Polo 2019).
Electronic trade ecosystem	<b>eTradeConnect</b> (formerly HKTFP)	Supported trade between Pricerite Home Limited (Pricerite), a furniture and household goods retailer, and its supplier Pro Logic International Ltd. by providing a single platform for creating, exchanging, and confirming the purchase order, invoice, and proof of delivery on eTradeConnect. The retailer submitted its trade finance request directly to HSBC using documents uploaded on eTradeConnect (HSBC 2018a).
Supply Chain Finance	<b>dltdledgers</b> , a Hyperledger Fabric-based platform built by Standard Chartered	The transaction was conducted in Singapore for Agrocrop International, facilitating the early payment for agricultural products purchased from Associated Grain Corp in Australia, and resold to a customer Bangladesh (January 2019; Wass 2019a)
Supply Chain Finance	<b>Chained Finance</b> (developed by Dianrong and FnConn)	A successful pilot and proof of concept have been completed through which \$6.5 million in loans were originated for small and medium-sized enterprise suppliers to Foxconn. The target markets were electronics, automotive and garment manufacturers (March 2017; Bermingham 2017).
e-marketplace for trade finance assets	<b>TradeAssets</b> (a Hyperledger Fabric-based auction platform for trade finance distribution, built by KrypC)	The first transaction was completed on 6 February, and the onboarded banks have now posted trade finance assets worth millions of US dollars, according to Fintech Innovations International, the United Arab Emirates-based company behind the platform (February 2019; Wass 2019b).

Sources: Barclays (2016); Bermingham (2017); Wass (2018a); Ledger Insights (2019); Marco Polo (2019); Wass (2019a); Wass (2019b); Wass (2019c); and Wass (2019d).

### Artificial Intelligence, Machine Learning, and Other Technologies

**Together with technologies like AI and machine learning, a digital trade finance platform can fully exploit its potential to benefit SMEs.** Analytics using AI and machine learning, for example, can transform a large number of nonfinancial transaction records into useful information in a digital lending platform to help determine whether to approve SME loans. According to the Boston Consulting Group, banks could save between \$2.5 billion and \$6 billion, and even increase revenues by 20%, if they incorporate an integrated digital solution featuring intelligent automation, collaborative digitalization, and future technology solutions (ICC 2018). Most fintech institutions also want to adopt blockchain and AI technologies over the short term (PwC 2017).

- Supplemented with big data, banks using AI can save costs for risk management by reducing false positives in compliance screening much quicker than current filtering technology. For example, Thomson Reuters World-Check, a database for AML/KYC, uses both AI and big data to identify high-risk entities before they are officially blacklisted. This led to up to a 50% drop in false positives (Dab et al. 2016).
- Machine learning can enhance the capability of optical character recognition, which turns paper documents to electronic format, and thus upgrades the system from simply transferring paper-based text to back-end fields in document processing to one that can also screens documents for consistency and compliance (Dab et al. 2016, Iriondo 2018). These solutions can auto-detect and even auto-correct errors in trade-related documents such as bills of lading and packing lists (Canava n.d.)

**Advanced information processing technology such as AI and machine learning can help reduce the trade finance gap.** These technologies lower the probability that a good (and small) firm is misclassified by financial institutions as bad (Box 7). Financial institutions may also be able to (i) obtain real-time information about the order passing each step in the supply chain, (ii) lower its total expense by adjusting its regulatory capital instead of offering a uniform interest rate, and (iii) pass cost savings on to the exporter by offering a lower interest rate (Lee et al. 2019). However, a bank's optimal level of technology investment may be lower than the social optimum that traders can enjoy from using these technologies. This makes the case for providing trade finance supplemented by the public sector, as well as for additional mechanisms to stimulate bank technology adoption (Lee, Yang, and Kim 2019).

## 4.2 | Issues and Constraints

**Digitalization is far from complete; and implementation costs are one of its biggest challenges.**

An ICC (2018) survey shows that roughly 40% of responding banks viewed digitalization as not part of their immediate agenda, though it remains at the developing stage among some 50% of respondents (Figure 23). This low adoption rate may be explained by banks' cautious approach in investing in emerging technologies unless other banks do so as well—ensuring expected benefits are above costs. Low implementation of bank payment obligations—where information is securely exchanged and validated in electronic form—illustrates the case (Box 8). The cost of adopting bank payment obligations is high because it requires an overhaul of well-integrated and long-standing processes; and both transaction parties must be bank-payment-obligation enabled. Slow pick-up, for now, stymies the solution.

### Box 7: Technology in Trade Finance: Findings from a Theoretical Approach

Micro, small, and medium-sized enterprises (MSMEs) in developing countries face severe financing problems, especially when trying to grow internationally. These difficulties can be traced to several factors, including inefficient processes, stringent regulations, and increased information asymmetry. To address these, various supply chain finance products can be used as well as existing and emerging types of fintech.

To illustrate how these could address the problems faced by firms, Lee, Yang, and Kim (2019) consider two main sources of information that form valuable signals about firms. One is tamper-free (such as public information), with the other subject to the firms' strategic manipulation (such as a certificate or qualification that the MSME may counterfeit). Each information source can signal that the firm is *bad* or *good*. Banks then use these signals to evaluate the firm. The objective of fintech is to improve the quality of these signals (lowering the probability a good firm is misclassified as bad), and thus contribute to mitigating the finance gap of firms who should have received financing but could not.

Types of fintech in trade finance markets (see Table 4 for examples) may be classified into two categories. *Information processing technology* (type A) such as artificial intelligence, allows banks to efficiently process and transform raw data into useful information (signals) that can directly guide decision-making. *Information collecting technology* (type B) such as digitalization allows financial institutions to collect additional and accurate data to be processed in decision-making.

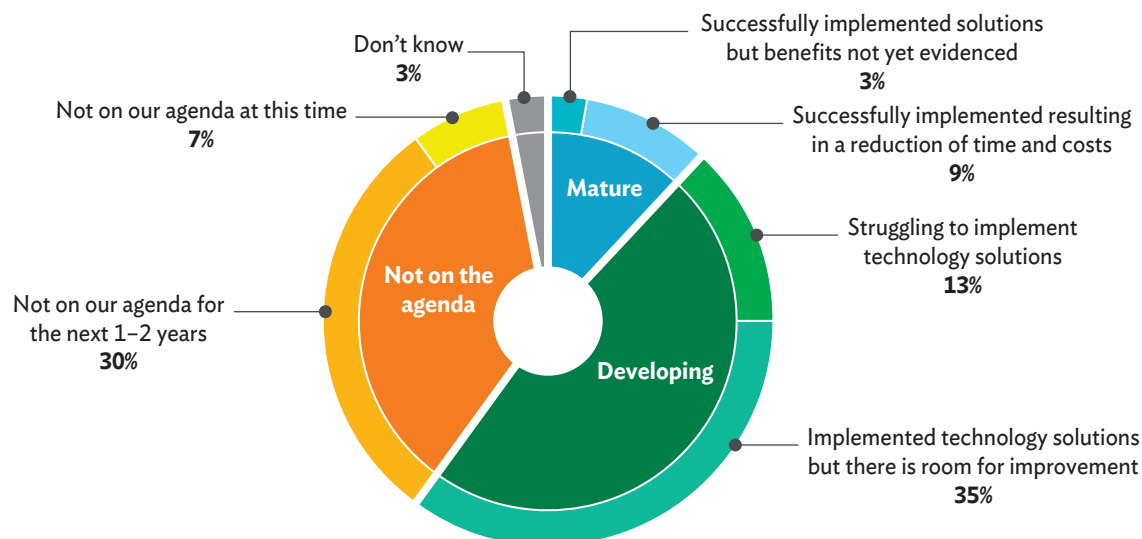
Intuitively, banks lend to firms classified as good (based on collected and processed signals). Otherwise, they will not receive financing regardless of their *true* nature (there is a probability that good firms are misclassified as bad, and vice versa). Under a game theoretic setting where a bank providing supply chain financing to exporters and importers—investing in type A and B technologies—financing gaps decrease as the investment in technologies increase. The bank's optimal investments in the technologies increase with respect to its size, profit margin, and the fraction of good firms in the market.

The theoretical model finds that a bank's optimal fintech investment level is lower than socially optimal<sup>a</sup> due to double marginalization.<sup>b</sup> The underinvestment is more severe when the supplier's profit margin is high. The intuition behind the underinvestment is that, as the bank receives just a fraction of the benefit, it has no incentive to invest to meet the socially optimal level. Governments and international organizations, whose objectives are more aligned with maximizing social welfare, could cover the investment shortfall.

<sup>a</sup> The socially optimal level is the result when all firms in the society act collectively (they take into account the *social costs and social benefits* in determining the level of investment) in contrast to the private optimum which is achieved when each firm acts on its own (only considering its *own costs and benefits*).

<sup>b</sup> Double marginalization is a common phenomenon in supply chains, where two parties at different vertical levels exercise their market powers to set their prices above their respective marginal costs, leading to welfare loss. Under this setup, the bank charges the exporter above its marginal cost, and then the exporter charges its importer customer above its marginal cost.

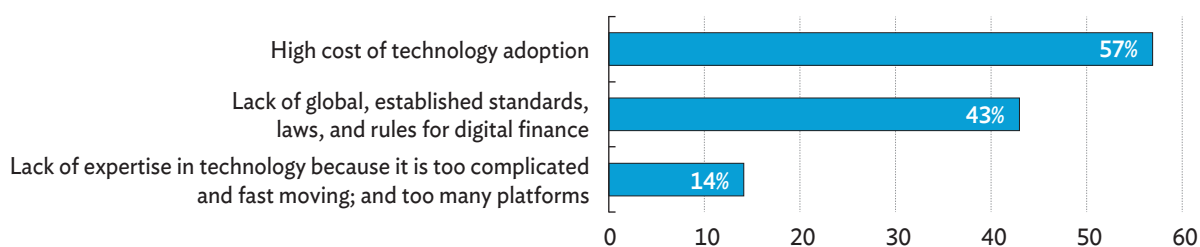
Source: Lee, Yang, and Kim (2019).

**Figure 23: State of Digitalization**

Note: Based on responses to maturity in using technology solutions to achieve benefits such as reduced time and costs as well as improved precision associated with trade-related due diligence.

Source: International Chamber of Commerce (2018).

**Fragmented digitalization can also create more challenges to digital implementation, making it difficult to be compatible and interoperable with other parties' systems.** Banks have invested in digital technologies mainly in their own parts of the trade finance process—for example, optical character recognition to digitize paper documents for use in internal operations. Trade finance stakeholders would benefit more from taking a holistic approach that requires digitalization of all parties in the trade cycle—including customs agents, shippers, and port authorities (Ganesh et al. 2018). This approach can be backed by establishing global standards and laws, because banks also view lack of global, established standards, laws, and rules for digital finance as one of the major impediments in adopting technology, along with lack of technology expertise (Figure 24).

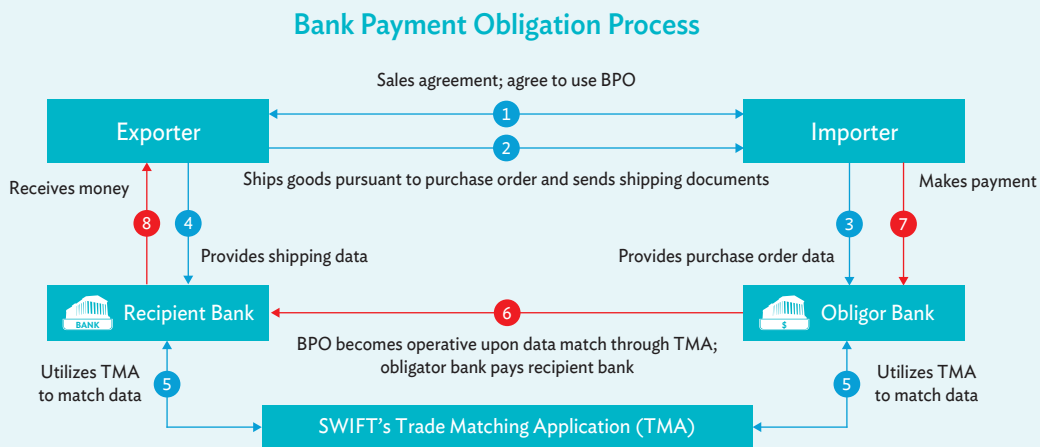
**Figure 24: Reasons to Not Use Technology (% of responding banks)**

Source: ADB (2019a).

**Box 8: Technology Adoption in Trade Finance: Lessons from the Bank Payment Obligation**

Under the bank payment obligation, a trade finance platform launched by SWIFT in 2013, the obligor bank (buyer bank) provides an irrevocable payment undertaking to the recipient bank (seller bank). It is a trade finance instrument created for risk mitigation and financing facilitation, particularly for buyers and sellers who *opt out of using documentary instruments* (which means that transactions are in data form). The bank payment obligation securely facilitates how these data are exchanged and validated, regardless of transaction size, geography, or industry.

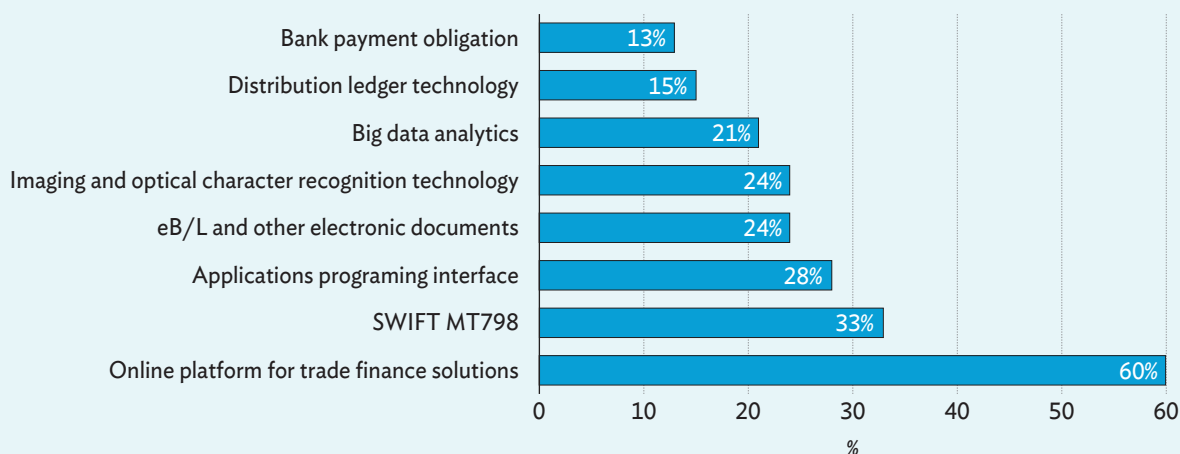
The bank payment obligation, unlike traditional trade finance instruments like letters of credit (LCs), cash-in-advance, and open account, “combines legally binding rules with electronic messaging and matching capabilities.” In other words, bank payment obligations can be characterized by a combination of the security of LCs and the simplicity of open accounts due to data-driven and automated process. One advantage of bank payment obligations is that it is governed by the International Chamber of Commerce (ICC) Uniform Rules for Bank Payment Obligation (BPO), which could be a precondition to wider adoption by banks.



BPO = bank payment obligation, SWIFT = Society for Worldwide Interbank Financial Telecommunication. Source: Simmons and Simmons (2015).

However, the bank payment obligation adoption rate of banks is low (13%) relative to other technologies, such as the MT798 (33%), application programming interfaces (28%), electronic bills of lading, and optical character recognition (both at 24%) (ICC 2018).<sup>a</sup> Technological infrastructure can explain the low adoption of BPOs, as both parties of the transaction must be BPO-enabled. However, installing this capability is expensive and would require the replacement of the bank’s current process (already long-established). So the benefits from migrating to BPOs do not necessarily outweigh its costs, hence the low adoption rate (Dab et al. 2016). This may have contributed to SWIFT’s decision to decommission its trade services utility in 2020, which functions as the sole ecosystem in which BPOs operate (PYMNTS 2019).

<sup>a</sup> MT798, also known as the trade envelope, is a verified message utilized for sending and receiving trade-related data between exporters, importers, and their banks all within the SWIFT system. MT798 provides a centralized, secure, and reliable connectivity among these trade participants without incurring additional fees for exporters and importers (Citibank 2015).

**Box 8: Continued****Types of Technologies Used to Digitize Trade Finance**

eB/L = electronic bill of lading, MT = message type.

Source: ICC Global Trade Finance Report (2018).

Future technological innovations should learn from this: (i) the chance of new technologies succeeding is higher if more parties are involved in implementation; (ii) platform interoperability is critical to realize the benefits from digitalization; and (iii) as the need for linked platforms increases, possible risks associated with the use of new technologies should be addressed to ensure secure data management (DiCaprio and Malaket 2019).

Sources: ADB, based on Dab et al (2016); ICC (2018—Q&A); Malaket (2015); SWIFT (n.d.); DiCaprio and Malaket (2019); and PYMNTS (2019).

**Blockchain technology is not entirely free of the risks related to transparency, cybersecurity, and operations, and poses regulatory challenges.** While blockchain and distributed ledger technology in general promote transparency—as data are accessible across all nodes in the network—it creates complications where parts of shared data require confidentiality (ADB 2019d). In a cross-border context, data protection laws vary among countries in Asia and the Pacific. Moreover, the use of blockchain technology cannot fix inaccurate data—when data are entered incorrectly, it is visible across the entire network, raising the likelihood that others act based on incorrect data. Similarly, any errors in the code implemented on the ledger are replicated across the entire network. Outdated or insecure code can be used by hackers. The main regulatory challenge for distributed ledger technology, including blockchains, lies in its complex nature. Early attempts to regulate digital ledger technology have included problems of terminology, especially in jurisdictions aiming to establish specific rules for blockchains (ADB 2019d). An accepted international terminology and agreed standards on defining digital ledger technology must be developed. Moreover, no systems of blockchain certification exist.



## 5

# Conclusion and Policy Considerations

Despite the smaller risks associated with trade finance transactions, there remains a general risk aversion, particularly for small firms, as the 2018 gap still amounts to an estimated \$1.5 trillion globally. SME cross-border trade is hampered by high costs for trade finance embedded in interest rates, collateral, regulatory requirements, and complex application procedures. Adopting new technologies holds significant potential to reduce costs from cumbersome paperwork and procedures, and thus increasing access to a far wider classes of borrowers. Digital technology such as fintech is helping to speed up transactions at lower cost while providing greater borrower convenience. While fintech can also enhance financial access, a key challenge is the cost of making it more widely available. Digital ledger technology, for instance, can reduce trade finance operating costs by 50%–70% and cut turnaround times to one-third or one-fourth of current levels (World Economic Forum and Bain & Company 2018). These can greatly help SMEs participate in international value chains if the requisite infrastructure is developed.

This section proposes that support for trade finance for SMEs can start nationally and regionally, with innovation strengthening support. To leverage the benefits of technology and reduce trade finance gaps, global efforts are also required to establish an enabling environment conducive to adopting technology. Disseminating knowledge on trade finance must be included, amid a lack of awareness and available information, particularly targeting SMEs and women-owned firms.

## 5.1 | How to Strengthen Support for Small and Medium-Sized Enterprise Trade Finance

**Given the persistent, large unmet demand for trade finance, national and regional public initiatives can supplement trade finance from the private sector.** This suggests greater public involvement, such as ECAs. National export credit agencies may be able to support work that the private market finds unprofitable or excessively risky. The 2008/09 global financial crisis showed the private market could not assure adequate liquidity—and the work of ECAs along with international financial institutions significantly contributed to the revitalization of global trade. Multilateral development banks (MDBs) can also contribute to the resource pool by providing guarantees and export credit. MDBs' trade finance programs contribute less than 0.5% of global goods trade; there is plenty of room to expand (Annex 1).

**To help SMEs grow, public intervention can reduce barriers to trade finance by adopting good practices in advanced economies, while supporting domestic credit guarantee schemes.**

The Korea Trade Insurance Corporation (KSURE), for example, offers SME exporters a group export trade insurance scheme, where agencies representing SMEs, such as trade associations, submit applications to KSURE. This benefits SMEs through lower search costs and increased awareness of credit availability and insurance. Meanwhile, retained earnings or informal networks that SMEs often use to fund operations are insufficient, hence SMEs can benefit by accessing external finance. Both domestic credit guarantee schemes and trade finance support can enable SMEs to shift from domestic to global value chains.

**Government collaboration with the private sector and other governments is critical to help spread technology adoption and enable cross-border trade financing.** For instance, the Hong Kong Monetary Authority (HKMA) and a consortium of 12 major banks in Hong Kong, China in 2018 launched eTradeConnect, a blockchain-based trade finance platform that enables digitizing trade documents and automating trade finance processes (HKMA 2018). The system will digitize paper documents and automate processes for stakeholders involved in the trade process. Government involvement at the start of the platform should help establish uniform rules and standards. To connect to other regions, eTradeConnect has been collaborating with we.trade, the first blockchain-based trade finance platform in Europe that has been providing service to 14 major European banks (we.trade 2018). Similarly, HKMA and the Monetary Authority of Singapore have also been jointly developing cross-border infrastructure—called the Global Trade Connectivity Network—to digitalize trade and trade finance between the two economies (HKMA 2017).

**Regional initiatives can also stimulate investments and spreading innovative technologies in developing economies.** Private sector innovation in emerging markets typically originates from homegrown entrepreneurs or global technology companies. However, the diffusion of useful technologies suffers from a lack of collaborative innovation ecosystems involving regulators, corporations, research institutes, and entrepreneurs (Box 9). These economies exhibit regulatory uncertainty, red tape, and weak intellectual property protection that discourage investment in technological innovation. Moreover, weak network effects impede the diffusion of technology from global technology companies to domestic entrepreneurs, while limited access to venture capital hampers developing startup businesses.

**A regional ECA can help pool resources and allocate capital more efficiently from surplus to deficit economies.** Many of Asia's developing countries are low- to middle-income economies facing difficulty in accessing international finance. There is large potential for exploiting trade opportunities by increasing access to trade finance. A regional ECA would facilitate intraregional trade through credit enhancement and risk mitigation measures to national ECAs in less developed economies; and enable accepting guarantees or LCs as exporters. MDBs, which have regional expertise across multiple sectors, can play a major role in coordinating national agencies and policies and fostering greater consensus for regional agreements. ADB, for instance, is studying the feasibility of establishing a multilateral trade credit and guarantee scheme (Box 10).

### **Box 9: Asian Development Bank’s Support for Spreading Technologies That Impact Sustainable Development Goals**

The Mekong Business Initiative, set up by the Australian government and the Asian Development Bank (ADB) in 2014, has provided targeted business support services and funding support for pilot-testing innovative business models that impact Sustainable Development Goals (SDGs). With a budget of \$10.5 million, the initiative focuses on less developed economies of the Association of Southeast Asian Nations—including Cambodia, the Lao People’s Democratic Republic, Myanmar, and Viet Nam. The initiative works with governments to improve alternative financing, focusing on fintech, by supporting regulatory reforms, building capacity of regulators, and conducting education and outreach programs to public and private stakeholders. It focuses on agriculture, tourism, financial services, and smart cities.

For instance, Kiu Global is a fintech company supported by the Mekong Business Initiative to help lower loan rejection rates for small and medium-sized enterprises (SMEs) that have inadequate collateral and credit histories. Kiu offers a cloud-based business management platform that automates business processes, such as sales, production, accounting, and purchasing, among others, to help companies increase efficiency. Platform data are then used by an artificial-intelligence-based credit scoring system that enables commercial banks and other financial institutions to gain information about the credit worthiness of SMEs. Kiu also offers electronic know-your-customer and loans to further address SME financing constraints. Thus far, Kiu has operations in seven countries across Asia with over 35,000 SMEs on its platform. It has partnered with 16 financial institutions in the region and helped disburse \$25 million in loans, with less than a 1% nonperforming loan rate.

Building on the successful pilots under the Mekong Business Initiative, the ADB Ventures Facility aims to finance the diffusion and scaling up of technologies and business models with proven support for SDGs. Designed as a multi-donor trust fund, the facility provides technical assistance and startup funding to stimulate investments in early-stage companies across Asia and the Pacific. With \$10 million initial funding for 2020–2022, the facility supports local startups with SDG-related solutions as well as assistance for market expansion of proven global technology providers to deploy solutions in the region.

Sources: ADB (2014, 2018); Kiu Global website (<https://www.kiuglobal.com/>).

## **5.2 | How to Promote Technology Adoption and Implementation**

**Developing a thriving fintech industry requires information and communication technology infrastructure and regulation.** Fintech startups are more likely to be established where the latest technology and supporting infrastructure are readily available (Haddad and Hornuf 2018). The number of secure internet services, mobile telephone subscriptions, and size of the labor force also have a positive impact on fintech startups, as does access to bank lending. These still need to be enhanced in many developing economies in Asia and the Pacific. Assistance to support infrastructure and regulatory reform, and providing venture capital for fintech startups, is needed.

### Box 10: Establishing a Regional Export Credit Agency in Asia

Small and medium-sized enterprises (SMEs) in developing economies are usually at a disadvantage when accessing lower-cost finance and export credit risk insurance—compared to foreign competitors supported by their national export credit agencies (ECAs). To help level the playing field, the Asian Development Bank (ADB) is providing a \$2.3 million technical assistance with cofinancing from the United Kingdom that will assess the feasibility and business potential for establishing a multilateral Trade Credit and Investment (re-)Guarantee Agency (TCIGA). This will be implemented from October 2018 to May 2020 and will cover the economies of Central and West Asia, East Asia, and South Asia to promote foreign direct investment and sustainable economic growth. Except for the People’s Republic of China and India, most economies in these subregions have inadequate trade-related infrastructure and financial support systems.

TCIGA would support SMEs and other nontraditional exporters to trade competitively at the domestic, regional, and global levels. It also will promote economic diversification and sustainable long-term growth through increased value-added production and employment. The agency is a pilot concept and should benefit from similar initiatives—such as the African Trade Insurance Agency, which has been operating since 2001.<sup>a</sup>

Similar to ECAs, TCIGA will provide insurance against nonpayment of global buyer receivables. Covering these would enhance the business continuity of suppliers and facilitate diversification in manufacturing and services. However, the agency would hopefully offer superior insurance coverage than that offered by existing national ECAs and export–import banks, which are capped by sovereign ratings. TCIGA is expected to have a higher rating due to its regional client base, globally diversified risk exposure to a wide range of domestic and foreign buyers and sectors, and capital contributions from its developing country members, which are potentially funded through ADB sovereign loans or grants to ADB developing member countries.

TCIGA can also benefit from potential equity participation from non-state members—such as regional or multilateral institutions, ECAs, export–import (EXIM) banks, and public and private reinsurers. Moreover, TCIGA is designed to supplement rather than overlap existing ECAs by accepting reinsurance, re-guarantees, and unfunded risk participations from member country ECAs and EXIM banks.

<sup>a</sup> The African Trade Insurance Agency was established in 2001 to support trade and foreign direct investment by offering credit and political risk insurance products. It has expanded from 7 to 14 countries, including 9 non-state members from Africa and Europe, and has supported over \$35 billion worth of trade and foreign direct investment. It continues to expand its partnerships and promote trade with North and South America.

Source: ADB (2018c).

**Coordination among stakeholders—including banks, firms, and regulators—is key to promote technology adoption and implementation.** The prospects for trade finance and technology can be enhanced by discussing its primary drivers and mutual benefits for participating parties. Blockchain technology will only realize its potential if industry participants agree on networks with common standards and business rules (Ganesh et al. 2018). Similarly, regulators need to coordinate policies to create an environment where digitized trade finance can function seamlessly.

**Coordination should also focus on the interoperability of various systems, as it can lead to widespread technology adoption in the medium to long term.** The experience of single window interoperability can offer some lessons (Box 11). Business needs should be rationalized if they offer mutual benefits to stakeholders and must be at the core of collaboration. The various levels of soft infrastructure to achieve interoperability can be determined—policy and legal interoperability, people and organizational interoperability, process and data interoperability, and platform and technical interoperability. These are necessary to achieve business goals.

### **Box 11: Lessons Learned from Single Window “Interoperability”**

A key provision of the World Trade Organization (WTO) Trade Facilitation Agreement (TFA) is the establishment of national single windows to facilitate trade transactions, by reducing waiting times at borders and to exchange information among various government agencies, businesses, and other stakeholders.<sup>a</sup> To maximize the benefits of national single windows, coverage should be extended to include cross-border electronic data exchange, or achieve “interoperability” between national single windows (UN/CEFACT 2017). Since concluding negotiations on the TFA in 2013, many governments with the support of their business community have increasingly been demanding interoperability between national single windows. While a fully functioning regionally integrated system is a long way off, implementing single window systems has benefited from the WTO agreement.<sup>b</sup>

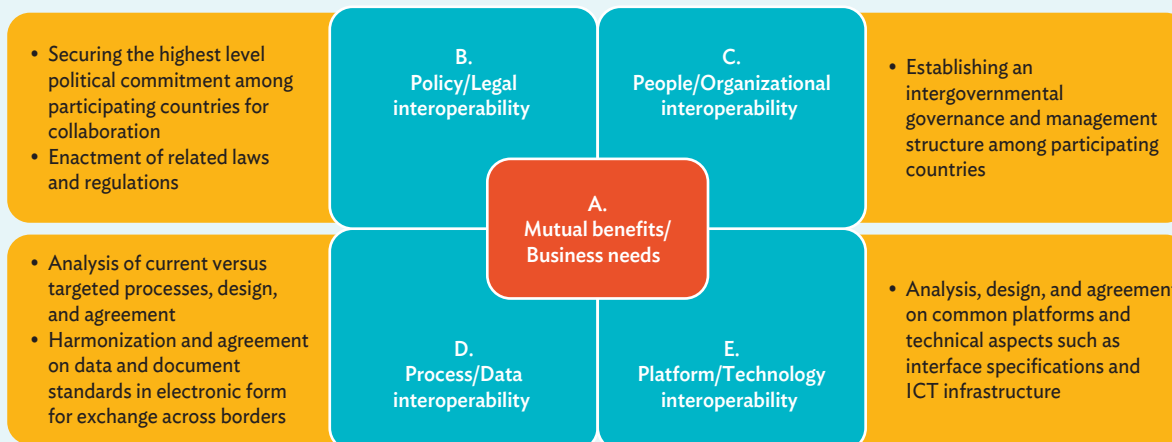
However, international agreements should be followed by national initiatives to achieve single window interoperability domestically, followed by international interoperability. While national initiatives including legislation, fiscal allocation, and organizational and technical requirements also require great political will, the establishment of the TFA paves the way for national single windows to be established, while Recommendation No. 36 by UN/CEFACT (2017) encourages initiatives toward both national and cross-border interoperability. Moreover, each country has its own unique circumstances and resulting arrangements.

The Association of Southeast Asian Nations (ASEAN) was one of the first organizations to conceptualize a regional single window project in 2005. The ASEAN Single Window will expedite cargo clearance and promote ASEAN economic integration by enabling the electronic exchange of trade-related documents among ASEAN members. Real-time operation of the regional single window began 1 January 2018 among five members—Indonesia, Malaysia, Singapore, Thailand, and Viet Nam.<sup>c</sup>

<sup>a</sup> According to UN/CEFACT (2005), a single window is defined by “a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfill all import, export, and transit-related regulatory requirements. If information is electronic, individual data elements should only be submitted once.”

<sup>b</sup> The WTO agreement identifies single window systems as one of its provisions as embodied in Article 10.4. Various aspects of the single window systems are also supported by the United Nations. Interoperability and its guidelines are articulated in so-called Recommendation No. 36, while Recommendation No. 34 supports Data Simplification and Standardization for International Trade, and Recommendation No. 35 is about Establishing a legal framework for international trade Single Window.

<sup>c</sup> The architecture is designed so the regional service monitors the exchange of data and ensures data integrity. The data exchange is bilateral while monitored regionally. For standardization, the basis of ASEAN data sets was the World Customs Organization’s data model Version 3.4 to harmonize the exchange of trade data that support expandability and scalability.

**Box 11: Continued****Framework for Cross-Border Single Window Interoperability**

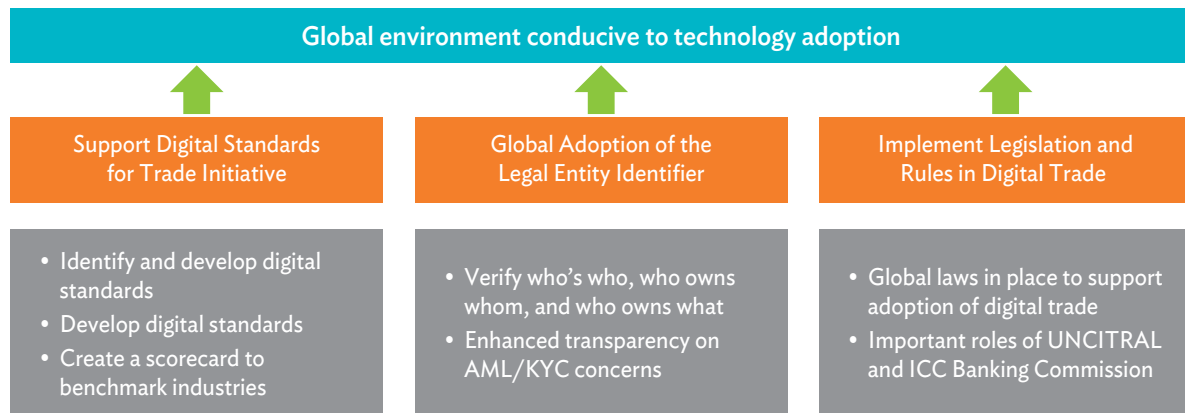
ICT = information and communication technology.

Cross-border single window interoperability requires a collaborative effort mainly between participating government agencies. The first step is to identify business needs. This includes the capture, analysis, evaluation, and agreement on business needs as the primary driver for cross-border interoperability. When business objectives have been identified, the system must be able to electronically exchange information between disparate and diverse single window facilities. The critical success factors include (i) policy and legal interoperability, (ii) people and organizational interoperability, (iii) process and data interoperability, and (iv) platform and technical interoperability.

For the ASEAN Single Window, factors (i) and (ii) have been achieved, but attaining (iii) and (iv) have been difficult due to the uniqueness of national single windows among ASEAN members. Live operations started after the ratification of the *Protocol on the Legal Framework to Implement the ASEAN Single Window* as well as the endorsement of the revised *ASEAN Trade in Goods Agreement* to allow acceptance of e-ATIGA Form D by all members in 2017.<sup>d</sup> This provided an environment where members can expedite the exchange of customs data for the import and export of goods. A key challenge, however, is to harmonize the data structure and process flow across differing single window systems.

<sup>d</sup> The Protocol on the Legal Framework to Implement the ASEAN Single Window governs the legal aspects of implementation—such as information security and confidentiality, integrity of data, protection of intellectual property rights and data ownership, and dispute settlement, among others. E-ATIGA Form D is a preferential Certificate of Origin that is accepted as evidence of origin by preference-giving economies (member economies of ASEAN Trade in Goods Agreement, ATIGA) to obtain preferential treatment.

Sources: APEC (2018); ASEAN Single Window website; ESCAP (2018); and UN/CEFACT (2005, 2017).

**Figure 25: Three Initiatives to Build an Environment Conducive to Technology Adoption**

AML = anti-money-laundering, ICC = International Chamber of Commerce, KYC = know-your-customer, UNCITRAL = United Nations Commission on International Trade Law.

Source: ADB compilation.

Against this backdrop, the following three initiatives can help create the basic infrastructure required to move trade technology for greater prosperity and inclusion (Figure 25).

### 1. Support Digital Standards for Trade Initiative

To create standards, protocols, and industry best practices, an initiative such as Digital Standards for Trade<sup>30</sup> may help coordinate disparate efforts of public and private stakeholders—customs, banks, shippers, and international organizations such as the International Organization for Standardization (ISO), World Customs Organization, and ICC. Digital Standards for Trade is designed for three functions: (i) to identify existing standards and choose or merge those most appropriate; (ii) to develop digital standards where they do not exist in concert with all stakeholders of the trade ecosystem; and (iii) to create a scorecard to benchmark industries, creating awareness and encouraging industry-wide digitizing initiatives.

<sup>30</sup> Digital Standards for Trade was launched in 2018 under the auspices of the World Trade Board (WTB), and consists of leaders from the WTB, MasterCard, and Nextrade Group that sets its direction and work plan. Its Technical Secretariat based in Singapore analyzes frictions and develops standards and solutions to interoperability in the trade ecosystem. The standards are considered by industry working groups consisting of private and public sector stakeholders across all areas of trade (Nextrade 2017).

## 2. Global Adoption of the Legal Entity Identifier

Trade digitalization also requires a harmonized identity for all companies worldwide, regardless of size. Mandated by the G20, the Financial Stability Board created the Global Legal Entity Identifier system in 2014 (Box 12). The nonprofit organization, supervised by over 70 regulators, created a system capable of issuing unique identifiers to verify (i) who's who, (ii) who owns whom, and (iii) who owns what. A major benefit includes enhanced transparency on AML/KYC concerns. It provides financial institutions with a large pool of metadata from which information on specific companies could be obtained for due diligence purposes.

## 3. Implement Legislation and Rules in Digital Trade

Given the potentially large efficiency gains from trade digitalization, material advances will not happen until global laws are in place to support adopting digital trade. The United Nations Commission on International Trade Law created the UNCITRAL Model Law on Electronic Transferable Records in 2017, following the Model Law on Electronic Commerce Laws and the Model Laws on Electronic Signatures.<sup>31</sup> To date, there has been scant recognition or adoption of these model laws in the legal framework nationally, with the effect that e-title documents, e-promissory notes, and e-bills of lading are not yet recognized as legally equivalent to paper-based trade documents. This has materially reduced potential advances in digitalization in the trade ecosystem. Governments need to adopt supporting legislation in a concerted fashion. In addition to the United Nations Commission on International Trade Law, the ICC has an important role to play. Formed in 1919 in the absence of a global system of rules to govern trade, the ICC created an industry standard, known as the Incoterms in 1936 that has become accepted by courts worldwide.<sup>32</sup> It is not much different today with respect to trade digitalization. The ICC Banking Commission has an important role to play in filling the void of acceptable rules.

## 5.3 | How to Reduce the Knowledge Gap for Trade Finance

**Improved awareness of trade finance products and reinforced with government support programs can help SMEs tap trade finance.** Directly engaging with SMEs and industry associations is critical to help SMEs develop export capability and enable exporters to develop more effective strategies that acknowledge the full cost of entering new markets. Exporting is more complex than domestic selling: it includes international marketing and sales, distribution, order fulfillment, shipping, and trade compliance, which often involve much greater investment in time and money than domestic trade (Suominen and Lee 2015).

<sup>31</sup> The Model Law on Electronic Transferable Records enables the legal use of electronic transferable records both domestically and across borders. It applies to electronic transferable records functionally equivalent to transferable documents or instruments. The Model Laws on Electronic Signatures works the same way as e-signatures. The Model Law on Electronic Commerce Laws facilitates e-commerce by providing national legislators a set of internationally accepted rules aimed at removing legal obstacles and increasing legal predictability for e-commerce (United Nations Commission on International Trade Law website).

<sup>32</sup> Incoterms rules are an internationally recognized standard used worldwide and by the United Nations Commission on International Trade Law in international and domestic contracts for the sale of goods. It was updated by Incoterms 2010 to further help traders avoid costly misunderstandings by clarifying costs, risks, and tasks involved in the delivery of goods from sellers to buyers. For instance, a common rule in trade, "Free On Board," means that the seller delivers the goods on board the vessel nominated by the buyer at the named port of shipment or procures the goods already delivered. The risk of loss or damage to the goods passes when the goods are alongside the ship, and the buyer bears all costs from that point (ICC website).



### Box 12: Legal Entity Identifier System

Regulators worldwide during the 2008/09 global financial crisis acknowledged their inability to identify parties to transactions across markets, products, and regions. This led the Financial Stability Board, along with G20 finance and central bank leaders, to advocate a universal legal entity identifier applicable to any legal entity that engages in financial transactions to facilitate evaluation of systemic risks and take corrective measures. The Legal Entity Identity, created by the Global Legal Entity Identifier Foundation works on the principle that each business should have only one identity and operates on a network of partners to provide trusted services and open, reliable data for unique legal entity identification worldwide. In short, it allows consumers and businesses to make reliable and less costly decisions on who to do business with. Its services include identification management for legal entities, accreditation for its network of partners, and other emerging services. The Legal Entity Identity is a unique 20-digit alphanumeric code based on an ISO standard assigned to legal entities.

A Legal Entity Identity can be freely accessed by the public sector, financial institutions, investment vehicles, corporations and small and medium-sized enterprises, private individuals, researchers, and others. Legal Entity Identity benefits the private sector through know-your-customer concerns, trade finance, distributed ledger solutions like blockchains, payment schemes, e-invoicing, and credit ratings, among others. Governments can also use Legal Entity Identity for risk assessment, market surveillance, and enforcement for regulators such as reporting on anti-money-laundering.

As of May 2019, there were 1,415,388 Legal Entity Identities issued globally. The main economies represented include the United States (13% of the total), the United Kingdom (10%), Germany (8%), Italy, and the Netherlands (7% each). Legal Entity Identities have also been issued in various countries in Asia and the Pacific, including India (24,493 issued), the People's Republic of China (4,313), the Marshall Islands (1,428), Thailand (756), Indonesia (685), Papua New Guinea (12), and Myanmar (2).

Source: GLEIF website, <https://www.gleif.org/en/>.

**More data on trade finance is needed.** The lack of a centralized database on trade finance suggests the need for initiatives to continue monitoring how much trade finance is provided to identify and respond to gaps—including those stemming from crises. Over the longer term, data collection could be used for creating consolidated data architecture on the global trade finance market to aid in data analysis, benchmarking, and policy advocacy.

**International organizations should continue to work toward reducing the knowledge gap for both SMEs and local banks.** To advance the use of technology and interoperability for trade finance, international organizations can maintain an open dialogue with trade finance regulators to ensure trade and development considerations are reflected when implementing regulations. Advanced economies can also offer resources and knowhow for improving the digital infrastructure of less developed countries to enhance global trade.

## REFERENCES

- American Express FX International Payments. 2015. *Trade Financing & Best Practice B2B Payments*.  
[https://files.alluremedia.com.au/m/c/pdf/editorial/FXIP\\_Whitepaper\\_on\\_Trade\\_Finance.pdf](https://files.alluremedia.com.au/m/c/pdf/editorial/FXIP_Whitepaper_on_Trade_Finance.pdf).
- Arner, D., J. Barberis, and R. Buckley. 2017. FinTech, RegTech, and the Reconceptualization of Financial Regulation. *Northwestern Journal of International Law & Business*. 37(3). pp. 371–413. <https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1817&context=njilb>.
- Asian Development Bank (ADB). 2009. ADB Signs Financing Agreements with Eight Viet Nam Banks to Boost Trade. <https://www.adb.org/news/adb-signs-financing-agreements-eight-viet-nam-banks-boost-trade> (accessed May 2019).
- . 2014. Mekong Business Initiative (Cofinanced by the Government of Australia). <https://www.adb.org/sites/default/files/project-document/150263/48270-001-tar.pdf>.
- . 2015. *Asian Development Outlook 2015: Financing Asia's Future Growth*. Manila. <https://www.adb.org/sites/default/files/publication/154508/ado-2015.pdf>.
- . 2016a. *2016 Trade Finance Gaps, Growth, and Jobs Survey*. <https://www.adb.org/sites/default/files/publication/190631/trade-finance-gaps.pdf>.
- . 2016b. ADB Trade Finance Program Agreement with Two Samoan Banks A Pacific First. <https://www.adb.org/news/adb-trade-finance-program-agreement-two-samoan-banks-pacific-first> (accessed May 2019).
- . 2017a. *2017 Trade Finance Gaps, Growth, and Jobs Survey*. <https://www.adb.org/sites/default/files/publication/359631/adb-briefs-83.pdf>.
- . 2017b. ADB, Kina Bank sign first trade finance deal in Papua New Guinea. <https://www.adb.org/news/adb-kina-bank-sign-first-trade-finance-deal-papua-new-guinea> (accessed May 2019).
- . 2018a. *ADB Provides Additional Trade Support for Viet Nam*. <https://www.adb.org/news/adb-provides-additional-trade-support-viet-nam> (accessed June 2019).
- . 2018b. *Embracing the E-commerce Revolution in Asia and the Pacific*. Manila. <https://www.adb.org/sites/default/files/publication/430401/embracing-e-commerce-revolution.pdf>.
- . 2018c. ADB Technical Assistant Report: Promoting Investment and Economic Growth in Central West Asia, East Asia, and South Asia Subregions. Manila.
- . 2019a. *2019 Trade Finance Gaps, Growth, and Jobs Survey*. Manila.
- . 2019b. *About the trade finance program*. <https://www.adb.org/sites/default/files/publication/29079/trade-finance-program-fact-sheet-2019.pdf>.
- . 2019c. *Trade Finance Program Brochure*. <https://www.adb.org/publications/trade-finance-program-brochure>.
- . 2019d. Distributed ledger technology and digital assets: policy and regulatory challenges in Asia. Manila.
- Asia-Pacific Economic Cooperation (APEC). 2018. *Study on Single Window Systems' International Interoperability: Key Issues for Its Implementation*. Singapore: APEC. <https://www.apec.org/Publications/2018/08/Study-on-Single-Window-Systems-International-Interoperability>.

- Association of Southeast Asian Nations (ASEAN) Single Window website. <http://asw.asean.org/> (accessed May 2019).
- Ayyagari, M., and K. Kim. 2019. Access to finance for SMEs: Role of Trade Finance, Trade Credit, and Technology. Manuscript.
- Bank for International Settlements (BIS). 2014. Trade finance: developments and issues. *CGFS Papers*. 50. Basel. <https://www.bis.org/publ/cgfs50.htm>.
- Barclays. 2016. Blockchain Revolution in Trade Finance. <https://www.barclayscorporate.com/insights/innovation/blockchain-revolution-in-trade-finance/> (accessed May 2019).
- Barnes, J., and J. Byrne. 2001. E-Commerce and Letter of Credit Law and Practice. *The International Lawyer*. 35(1). pp. 23–29. <https://www.jstor.org/stable/40707592>.
- BBVA. 2018. What is the difference between DLT and blockchain? <https://www.bbva.com/en/difference-dlt-blockchain/> (accessed May 2019).
- Bermingham, F. 2017. Chinese companies claim blockchain SCF first. <https://www.gtreview.com/news/asia/chinese-companies-claim-blockchain-first-in-supply-chain-finance/> (accessed May 2019).
- Berne Union Website. Berne Union Members. <https://www.berneunion.org/Members> (accessed June 2019).
- Blockgeeks. 2019. What is Blockchain Technology? A Step-by-Step Guide For Beginners. <https://blockgeeks.com/guides/what-is-blockchain-technology/> (accessed May 2019).
- Boston Consulting Group. 2018. Digital trade/Plotting the path to transformation. In *ICC Global Survey 2018*.
- Cecchetti, S., and K. Schoenholtz. 2017. Adverse Selection: A Primer. <https://www.moneyandbanking.com/commentary/2017/8/13/adverse-selection-a-primer> (accessed May 2019).
- CheHashim, R., and N. S. Mahdzan. 2014. Fraud in Letter of Credit Transactions: The Experience of Malaysian Bankers. *International Journal of Law, Crime and Justice*. 42(3). pp. 224–236. <https://doi.org/10.1016/j.ijlcj.2014.01.008>.
- Citibank. 2015. *Citi's Capability for SWIFT MT798: Frequently Asked Questions*. [http://www.citigroup.com/transactionservices/home/trade\\_svcs/financing/docs/mt798\\_FAQ.pdf](http://www.citigroup.com/transactionservices/home/trade_svcs/financing/docs/mt798_FAQ.pdf).
- Committee on the Global Financial System (CGFS). 2014. Trade Finance: Developments and Issues. *CGFS Papers*. 50. Basel: BIS. <https://www.bis.org/publ/cgfs50.pdf>.
- Credit Risk Database (CRD). 2019. Data Accumulation. [http://www.crd-office.net/CRD/en/structure/data\\_chiku.html](http://www.crd-office.net/CRD/en/structure/data_chiku.html) (accessed May 2019).
- Creehan, S. 2018. How Digital Innovation Can Increase Small Business Access to Finance in Asia. *Asia Focus*. San Francisco: Federal Reserve Bank of San Francisco. <https://www.frbsf.org/banking/files/Asia-Focus-How-Digital-Innovation-Can-Increase-Small-Business-Access-to-Finance-in-Asia.pdf>.
- Dab, S., et al. 2016. Digital Revolution in Trade Finance. <https://www.bcg.com/publications/2016/digital-revolution-trade-finance.aspx> (accessed May 2019).
- Debitoor. 2018. 5 ways cloud-based invoice software benefits SMEs. <https://debitoor.com/blog/5-ways-cloud-based-invoice-software-benefits-smes> (accessed May 2019).
- Deloitte. 2018. *Role of Trade Finance for Inclusive Growth*. New York: Deloitte. <https://www2.deloitte.com/content/dam/Deloitte/in/Documents/financial-services/in-fs-role-of-trade-finance-for-inclusive-growth-web-noexp.pdf>.

- DiCaprio, A., and A. Malaket. 2019. Digital Islands in Trade Finance: Can a Decentralized System Solve the Network Problem? *R3 Reports*. [https://www.r3.com/wp-content/uploads/2018/10/Digital\\_Islands\\_R3-1.pdf](https://www.r3.com/wp-content/uploads/2018/10/Digital_Islands_R3-1.pdf).
- DiCaprio, A., Y. Yao, and R. Simms. 2017. Women and Trade: Gender's Impact on Trade Finance and Fintech. *ADB Working Paper Series*. 797. Tokyo: Asian Development Bank Institute. <https://www.adb.org/sites/default/files/publication/389186/adbi-wp797.pdf>.
- Eker, O. 2018. Letter of Credit Fees. <https://www.letterofcredit.biz/index.php/2018/01/23/letter-of-credit-fees/> (accessed May 2019).
- Ernst & Young. *KYC automation using artificial intelligence (AI)*. [https://www.ey.com/Publication/vwLUAssets/ey-kyc-automation-using-ai/\\$FILE/ey-kyc-automation-using-ai.pdf](https://www.ey.com/Publication/vwLUAssets/ey-kyc-automation-using-ai/$FILE/ey-kyc-automation-using-ai.pdf).
- Export-Import Bank of Thailand (EXIM Thailand). 2016. *EXIM Thailand launches new service "Instant SMEs export insurance" easy application, quick approval, with up to 1 million baht coverage*. [http://www.exim.go.th/doc/adn/5900005847\\_0.pdf](http://www.exim.go.th/doc/adn/5900005847_0.pdf).
- . 2017. *EXIM Thailand launches new credit facility "Export credit plus" to assist SMEs pioneering new markets and boosting Thai export growth in 2017*. [http://www.exim.go.th/doc/adn/6000006231\\_0.pdf](http://www.exim.go.th/doc/adn/6000006231_0.pdf).
- . 2018. *EXIM Thailand focuses on product development to promote trade and investment in CLMV and build strong SME exporters with "EXIM happy credit" for SME export start-ups without collaterals*. [http://www.exim.go.th/doc/adn/6100007142\\_0.pdf](http://www.exim.go.th/doc/adn/6100007142_0.pdf).
- Faber, E. 2017a. Trade finance: A catalyst for foreign currency, growth in PNG. <https://blogs.adb.org/blog/trade-finance-catalyst-foreign-currency-growth-png> (accessed May 2019).
- . 2017b. Trade finance helps Pacific business thrive. <https://blogs.adb.org/blog/trade-finance-helps-pacific-business-thrive> (accessed May 2019).
- Finextra. 2019. Standard Chartered completes LoC blockchain transaction on Voltron. <https://www.finextra.com/newsarticle/34227/standard-chartered-completes-loc-blockchain-transaction-on-voltron>.
- Foley, C. F., M. Johnson, and D. Lane. 2010. Note on international trade finance. *Harvard Business School Background Note*. 211-007. Cambridge, MA: Harvard Business School. <https://hbr.org/product/Note-on-International-Tra/an/211007-PDF-ENG>.
- Fong, V. 2018. Open Banking in Asia: A Breakdown of Initiative Across the Region. <http://fintechnews.sg/24627/fintech/open-banking-in-asia/> (accessed June 2019).
- Ganesh, S., T. Olsen, J. Kroeker, and P. Venkatraman. 2018. Rebooting a Digital Solution to Trade Finance. <https://www.bain.com/insights/rebooting-a-digital-solution-to-trade-finance/> (accessed May 2019).
- Global Legal Entity Identifier Foundation (GLEIF) website. The Global LEI System. <https://www.gleif.org/en/about-lei/gleif-management-of-the-global-lei-system> (accessed May 2019).
- Haddad, C., and L. Hornuf. 2018. The emergence of the global fintech market: Economic and technological determinants. *Small Bus. Econ* (2019) 53: 81. <https://doi.org/10.1007/s11187-018-9991-x>
- He, D., et al. 2017. Fintech and Financial Services: Initial Considerations. *IMF Staff Discussion Note*. Washington, DC: International Monetary Fund. <https://www.imf.org/~media/Files/Publications/SDN/2017/sdn1705.ashx>.

- Helble, M., and Shepherd, B., eds. 2017. *Win-Win: How International Trade Can Help Meet the Sustainable Development Goals*. Tokyo: Asian Development Bank Institute. <https://www.adb.org/sites/default/files/publication/327451/adbi-win-win-how-international-trade-can-help-meet-sdgs.pdf>.
- Hong Kong Monetary Authority (HKMA). 2017. Hong Kong and Singapore launch a joint project on cross-border trade and trade finance platform. <https://www.hkma.gov.hk/eng/key-information/press-releases/2017/20171115-6.shtml> (accessed June 2019).
- . 2018. The launch of eTradeConnect and the Collaboration with we.trade. <https://www.hkma.gov.hk/eng/key-information/press-releases/2018/20181031-4.shtml> (accessed July 2019).
- HSBC. 2018a. HSBC and ING execute groundbreaking live trade finance transaction on R3's Corda Blockchain platform. <https://www.hsbc.com/media/media-releases/2018/hsbc-trade-blockchain-transaction-press-release> (accessed May 2019).
- . 2018b. *HSBC Completes First Batch of Live Pilot Trade Finance Transactions on eTradeConnect Blockchain Platform*. <https://www.about.hsbc.com.hk/-/media/hong-kong/en/news-and-media/181031-hsbc-completes-rst-batch-of-transactions-on-etradeconnect-eng.pdf> (accessed July 2019).
- Inter-Lawyer. 2003. Chapter 1: Convincing Arguments to Promote the Electronic Bill of Lading. <http://www.inter-lawyer.com/lex-e-scripta/articles/electronic-bills-of-lading-1.htm> (accessed May 2019).
- International Chamber of Commerce (ICC). 2010. *Report on findings of ICC-ADB Register on Trade & Finance*. [https://iccwbo.org/content/uploads/sites/3/2010/09/ICC-Register-Report\\_September-2010.pdf](https://iccwbo.org/content/uploads/sites/3/2010/09/ICC-Register-Report_September-2010.pdf).
- . 2014. *2014 ICC Trade Register Report Summary*. Paris: International Chamber of Commerce. <https://cdn.iccwbo.org/content/uploads/sites/3/2016/05/ICC-Trade-Register-Report-2014-summary.pdf>.
- . 2017. *2017 Rethinking Trade & Finance*. Paris: International Chamber of Commerce. <https://cdn.iccwbo.org/content/uploads/sites/3/2017/06/2017-rethinking-trade-finance.pdf>.
- . 2018. *ICC Global Survey 2018: Securing future growth*. Paris: International Chamber of Commerce. <https://iccwbo.org/publication/global-survey-2018-securing-future-growth/>
- International Monetary Fund. 2017. *Fintech and Financial Services: Initial Considerations*. <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2017/06/16/Fintech-and-Financial-Services-Initial-Considerations-44985>.
- Iriondo, R. 2018. Differences Between AI and Machine Learning and Why it Matters. <https://medium.com/datadriveninvestor/differences-between-ai-and-machine-learning-and-why-it-matters-1255b182fc6> (accessed May 2019).
- Karlan, D., and J. Zinman. 2009. Observing Unobservables: Identifying Information Asymmetries with a Consumer Credit Field Experiment. *Econometrica*, Vol. 77, No. 6 (Nov 2009), pp. 1993–2008.
- Khan, F. 2019. What are the different types of DLTs & how they work? <https://www.datadriveninvestor.com/2019/02/14/what-are-the-different-types-of-dlts-how-they-work/> (accessed May 2019).
- Kiu website. About Kiu. <https://www.kiuglobal.com/about> (accessed June 2019).
- Korea Trade Insurance Corporation (KSURE). 2018. 무역보험 제도안내. [https://www.ksure.or.kr/html/down/ksure\\_guide\\_01.pdf](https://www.ksure.or.kr/html/down/ksure_guide_01.pdf).

- Lasaga, M. 2016. *The Impact of Basel III on Trade Finance*. <http://www.stratinfo.com/media/be6ebb86db1b7859ffff802efffe907.pdf>.
- Ledger Insights. 2019. HSBC uses blockchain for Letter of Credit between Australia and China. <https://www.ledgerinsights.com/blockchain-trade-finance-voltron-hsbc-letter-of-credit/> (accessed May 2019).
- Lee, H., S. A. Yang, and K. Kim. 2019. Information Friction, FinTech, and Supply Chain Finance. Manuscript.
- Lee, H. L., et al. 2019. Milestone-based Supply Chain Finance. Manuscript.
- Malaket, A. R. 2014. *Financing Trade and International Supply Chains – Commerce Across Borders*. Surrey: Gower Publishing. <https://www.taylorfrancis.com/books/9781315582436>.
- . 2015. Financing Trade and Supply Chains. *Policy Brief*. 47. Asia-Pacific Research and Training Network on Trade. <https://www.unescap.org/sites/default/files/polibrief47.pdf>.
- Malesova, B. 2016. *The Impact of Basel III on Trade Finance*. Master's thesis. <https://is.cuni.cz/webapps/zzp/download/120212839>.
- Marco Polo. 2019. Commerzbank and LBBW are pioneering with Voith and KSB in the digital transformation of trade finance solutions. <https://www.marcopolo.finance/commerzbank-and-lbbw-are-pioneering-with-voith-and-ksb-in-the-digital-transformation-of-trade-finance-solutions/> (accessed May 2019).
- Mayersen, I. 2019. Amazon stats show 50,000 SMBs on its platform exceeded half a million in sales last year. <https://www.techspot.com/news/78353-amazon-stats-show-50000-smbs-platform-exceeded-half.html> (accessed May 2019).
- Mead, C. 1922. Documentary Letters of Credit. *Columbia Law Review*. 22(4). pp. 297–331. <https://www.jstor.org/stable/pdf/1111302.pdf>.
- Mitchell, D. 5 IoT applications retailers are using today. [https://www.sas.com/en\\_ph/insights/articles/big-data/five-iot-applications-retailers-are-using-today.html](https://www.sas.com/en_ph/insights/articles/big-data/five-iot-applications-retailers-are-using-today.html) (accessed May 2019).
- Morel, F. 2011. Credit Insurance in Support of International Trade: Observations Throughout the Crisis. In J. Chauffour and M. Malouche, eds. *Trade Finance during the Great Trade Collapse*. Washington, DC: The International Bank for Reconstruction and Development/The World Bank. <http://siteresources.worldbank.org/INTRANETTRADE/Resources/TradeFinanceEntire.pdf>.
- Morris, N. 2018. Trade finance blockchain race is about to start. <https://www.ledgerinsights.com/wetrade-trade-finance-blockchain-race/> (accessed May 2019).
- Moyano, J. and O. Ross 2017. KYC Optimization Using Distributed Ledger Technology. *Bus Inf Syst Eng*. 59(6).pp. 411–423. <https://doi.org/10.1007/s12599-017-0504-2>.
- Nextrade Group, LLC. 2017. *Digital Standards for Trade (DST) built by Nextrade for Mastercard launches in Singapore*. <https://www.nextradegroupllc.com/single-post/2017/12/19/Digital-Standards-for-Trade-DST-built-by-Nextrade-for-MasterCard-launches-in-Singapore>.
- Nicholls, A. 2016. Are AML (Anti-Money-Laundering) requirements hindering SME access to trade finance? Caribbean Trade Law and Development. <https://caribbeantradelaw.com/2016/06/05/are-anti-money-laundering-aml-requirements-hindering-access-to-trade-finance/>.
- Niepmann, F., and T. Schmidt-Eisenlohr. 2017. International trade, risk and the role of banks. *Journal of International Economics*. 107. pp. 111–126. <https://doi.org/10.1016/j.jinteco.2017.03.007>.

- Organisation for Economic Co-operation and Development (OECD) website. Export credits. <http://www.oecd.org/tad/xcred/eca.htm> (accessed June 2019).
- Özkan, Ö., O. Bayram, G. Karakaya, and E. Karakaya. 2014. Is the Letter of Credit Losing its Significance? A New Payment Method in International Trade BPO/Bank Payment Obligation. *International Journal of Arts and Commerce*. 3(7). pp. 50–58. [https://www.researchgate.net/publication/319522500\\_IS\\_THE\\_LETTER\\_OF\\_CREDIT\\_LOSING\\_ITS\\_SIGNIFICANCE\\_A\\_NEW\\_PAYMENT\\_METHOD\\_IN\\_INTERNATIONAL\\_TRADE\\_-\\_BPOBANK\\_PAYMENT\\_OBLIGATION](https://www.researchgate.net/publication/319522500_IS_THE_LETTER_OF_CREDIT_LOSING_ITS_SIGNIFICANCE_A_NEW_PAYMENT_METHOD_IN_INTERNATIONAL_TRADE_-_BPOBANK_PAYMENT_OBLIGATION).
- Palmer, H. 2001. *Trade Finance Risk: Documentary Fraud and Money Laundering*. London: Euromoney Books.
- Pimentel. 2017. Wave Completes Blockchain Bill of Lading Pilot. <https://blocktribune.com/wave-completes-blockchain-bill-lading-pilot/> (accessed July 2019).
- Pokharel, S. 2017. Plugging Viet Nam's trade finance gap. <https://blogs.adb.org/blog/plugging-viet-nams-trade-finance-gap> (accessed May 2019).
- PricewaterhouseCoopers (PwC). 2017. *PwC Global FinTech Report 2017*. <https://www.pwc.com/gx/en/industries/financial-services/assets/pwc-global-fintech-report-2017.pdf>.
- PYMNTS. 2015. The Downfall of The Letter of Credit. <https://www.pymnts.com/in-depth/2015/the-downfall-of-the-letter-of-credit/> (accessed May 2019).
- . 2019. SWIFT Set to Shutter Data Matching Tool TSU. <https://www.pymnts.com/news/b2b-payments/2019/swift-trade-supply-chain-finance-services/> (accessed May 2019).
- Rojas-Suarez, L. 2018. Basel III & Unintended Consequences for Emerging Markets and Developing Economies – Part 1: Cross-border Spillover Effects. <https://www.cgdev.org/blog/basel-iii-unintended-consequences-emerging-markets-and-developing-economies-part-1-cross-border> (accessed May 2019).
- Simmons and Simmons. 2015. *Structures & Solutions in Trade Finance*. <http://www.elexica.com/en/resources/microsite/structures-solutions-in-trade-finance>.
- Surbhi, S. 2016. Difference Between Factoring and Forfaiting. <https://keydifferences.com/difference-between-factoring-and-forfaiting.html> (accessed May 2019).
- SWIFT website. The Bank Payment Obligation (BPO). [https://www2.swift.com/sitesearch/#/?q=The%20Bank%20Payment%20Obligation%20\(BPO](https://www2.swift.com/sitesearch/#/?q=The%20Bank%20Payment%20Obligation%20(BPO) (accessed May 2019).
- Taafe, O. 2018. Trade Finance Drives Economic Growth. <https://www.libf.ac.uk/news-and-insights/news/detail/2018/06/08/trade-finance-drives-economic-growth> (accessed May 2019).
- Tarver, E. 2018. *How Do Financial Markets Exhibit Asymmetric Information?* <https://www.investopedia.com/ask/answers/042915/how-do-financial-market-exhibit-asymmetric-information.asp> (accessed May 2019).
- Thieffry, G. 2016. Basel III and Commodity Trade Finance: An Update. *Journal of International Banking Law and Regulation*. 31(3). pp. 124–132. [http://www.gtlaw.ch/publications/Thieffry\\_2016\\_JIBLR\\_Issue\\_3\\_Article.pdf](http://www.gtlaw.ch/publications/Thieffry_2016_JIBLR_Issue_3_Article.pdf).
- Thomson Reuters. 2017. Thomson Reuters 2017 Global KYC Surveys Attest to Even Greater Compliance Pain Points. <https://www.thomsonreuters.com/en/press-releases/2017/october/thomson-reuters-2017-global-kyc-surveys-attest-to-even-greater-compliance-pain-points.html> (accessed May 2019).

- TradeLens. n.d. *TradeLens Solution Brief*. [https://www.tradelens.com/wp-content/uploads/2018/12/TradeLens-Solution-Brief\\_Edition-One.pdf](https://www.tradelens.com/wp-content/uploads/2018/12/TradeLens-Solution-Brief_Edition-One.pdf).
- Uchida, H. 2011. What Do Banks Evaluate When They Screen Borrowers? Soft Information, Hard Information and Collateral. *Journal of Financial Services Research*. 40(1-2). pp. 29-48. <https://doi.org/10.1007/s10693-010-0100-9>.
- United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT). 2005. *Recommendation No. 33: Recommendation and Guidelines on establishing a Single Window to enhance the efficient exchange of information between trade and government*. New York and Geneva: United Nations Centre for Trade Facilitation and Electronic Business. [https://www.unece.org/fileadmin/DAM/cefact/recommendations/rec33/rec33\\_trd352e.pdf](https://www.unece.org/fileadmin/DAM/cefact/recommendations/rec33/rec33_trd352e.pdf).
- . 2017. *Single Window Interoperability Recommendation No. 36*. New York and Geneva: United Nations Centre for Trade Facilitation and Electronic Business. [http://www.unece.org/fileadmin/DAM/trade/Publications/ECE-TRADE-431E\\_Rec36.pdf](http://www.unece.org/fileadmin/DAM/trade/Publications/ECE-TRADE-431E_Rec36.pdf).
- United Nations Economic and Social Council. 2018. *Follow-up and review of the financing for development outcomes and the means of implementation of the 2030 Agenda for Sustainable Development*. <https://undocs.org/E/FFDF/2018/L.2>.
- United Nations Economic Commission for Europe (UNECE) website. Single window for trade. <http://tfig.unece.org/contents/single-window-for-trade.htm> (accessed May 2019).
- Viet Nam Customs. *Implementation of National Single Window and ASEAN Single Window*. [https://www.unescap.org/sites/default/files/2.%20Session%201%20%28Part%20%29\\_Viet%20Nam%20Country%20Status.pdf](https://www.unescap.org/sites/default/files/2.%20Session%201%20%28Part%20%29_Viet%20Nam%20Country%20Status.pdf).
- Wass, S. 2018a. First four banks go live on we.trade blockchain platform. <https://www.gtreview.com/news/fintech/first-four-banks-go-live-on-we-trade-blockchain-platform/> (accessed May 2019).
- . 2018b. we.trade and Batavia merge blockchain platforms for trade finance. <https://www.gtreview.com/news/fintech/we-trade-and-batavia-merge-blockchain-platforms-for-trade-finance/> (accessed June 2019).
- . 2019a. Standard Chartered implements dltledgers blockchain platform for trade finance. <https://www.gtreview.com/news/fintech/standard-chartered-implements-dltledgers-blockchain-platform-for-trade-finance/> (accessed May 2019).
- . 2019b. UAE-based blockchain platform for trade finance distribution goes live with 25 banks. <https://www.gtreview.com/news/mena/uae-based-blockchain-platform-for-trade-finance-distribution-goes-live-with-25-banks/> (accessed May 2019).
- . 2019c. Banks start using we.trade blockchain platform for open account trade finance. <https://www.gtreview.com/news/fintech/banks-start-using-we-trade-blockchain-platform-for-open-account-trade-finance/> (accessed May 2019).
- . 2019d. Voltron blockchain consortium to create independent company ahead of commercial launch. <https://www.gtreview.com/news/fintech/voltron-blockchain-consortium-to-create-independent-company-ahead-of-commercial-launch/> (accessed May 2019).



- we.trade website. Businesses. <https://we-trade.com/businesses> (accessed June 2019).
- Web document Disruption Banking. 2018. *The 5 trade finance consortia testing blockchain*.  
<http://disruptionbanking.com/the-5-trade-finance-consortia-testing-blockchain/>.
- World Bank. Enterprise Surveys. <https://www.enterprisesurveys.org/portal/login.aspx> (accessed July 2018).
- World Economic Forum and Bain & Company. 2018. *Trade Tech – A New Age for Trade and Supply Chain Finance*. [http://www3.weforum.org/docs/WEF\\_White\\_Paper\\_Trade\\_Tech\\_.pdf](http://www3.weforum.org/docs/WEF_White_Paper_Trade_Tech_.pdf).
- World Trade Organization (WTO). 2016. *Trade Finance and SMEs: Bridging the Gaps in Provision*. Geneva: World Trade Organization. [https://www.wto.org/english/res\\_e/booksp\\_e/tradefinsme\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/tradefinsme_e.pdf).
- . 2018. *World Trade Statistical Review 2018*. Geneva: World Trade Organization. [https://www.wto.org/english/res\\_e/statis\\_e/wts2018\\_e/wts2018\\_e.pdf](https://www.wto.org/english/res_e/statis_e/wts2018_e/wts2018_e.pdf).
- Zausner, S. 2017. Explainer: For SMEs, Access to Finance isn't the Problem. Lending is. <https://www.andeglobal.org/blogpost/920159/282924/Explainer-For-SMEs-access-to-finance-isn-t-the-problem-Lending-is> (accessed May 2019).

# ANNEXES

## Annex 1: Size of the Trade Finance Market, 2017

	Value (\$ billion)	Share (% global merchandise export)
<b>Interfirm trade credit</b>	<b>10,638</b>	<b>60</b>
Open account	7,092	40
Cash-in-advance	3,546	20
<b>Bank-intermediated trade finance</b>	<b>7,092</b>	<b>40</b>
<b>By region</b>		
Asia and the Pacific	3,262	46
Advanced Asia	922	13
Developing Asia	638	9
India	638	9
People's Republic of China	851	12
Pacific	213	3
Europe	1,347	19
Americas	1,277	18
Middle East and Africa	922	13
Russian Federation and Commonwealth of Independent States	284	4
<b>By firm size</b>		
MNEs and large corporates	3,404	48
Mid-cap	2,766	39
Micro and SMEs	922	13
<b>By product</b>		
<b>Traditional trade finance</b>	<b>6,028</b>	<b>85</b>
Commercial LC	2,954	49
Collections	1,447	24
Guarantees	965	16
Standby LC	663	11
<b>Supply chain finance</b>	<b>1,064</b>	<b>15</b>
Payables finance	295	28
Receivables finance	263	25
Factoring and its variations	179	17

continued next page

**Annex 1: Continued**

	Value (\$ billion)	Share (% global merchandise export)
Loan or advance against receivables	169	16
Pre-shipment finance	63	6
Forfaiting	42	4
Loan or advance against inventory	32	3
Distributor finance	21	2
<b>Global merchandise export in 2017</b>	<b>17,730</b>	<b>100</b>
<b>Memo:</b>		
<b>Trade finance supported by export credit agencies (2017)</b>	<b>2,331</b>	<b>13.15</b>
Short-term export credit insurance	2,088	11.78
Medium/long-term export credit insurance	179	1.01
Investment insurance	64	0.36
<b>MDB trade finance programs (transactions in 2017)</b>	<b>20.9</b>	<b>0.12</b>
IFC	6.7	0.04
ITFC	4.9	0.03
ADB	4.5	0.03
EBRD	2.3	0.01
AfDB	1.8	0.01
IDB Invest	0.8	0.00

ADB = Asian Development Bank; Advanced Asia = Hong Kong, China, Japan, the Republic of Korea, and Singapore; CIS = Commonwealth of Independent States; Developing Asia = Developing Asia excluding the PRC and India; EBRD = European Bank for Reconstruction and Development; ECA = export credit agency; IDB Invest = the private sector arm of the Inter-American Development Bank Group; IFC = International Finance Corporation; ITFC = International Islamic Trade Finance Corporation; LC = letter of credit; MDB = multilateral development bank; MNE = multinational enterprise; PRC = People's Republic of China; SMEs = small and medium-sized enterprises.

Notes: (i) Shares of bank-intermediated and interfirm trade finance are taken average of the lower and upper bound estimates from Malaket (2014) and BIS (2014), and rounded up to the nearest ten; (ii) Denominator for the shares under the subcategories of bank-intermediated trade finance is total value of the bank-intermediated trade finance; (iii) Trade finance supported by export credit agencies represent aggregate new businesses underwritten by members of the Berne Union in 2017.

Sources: ADB, based on ADB (2017a), BIS (2014), ICC (2018), Malaket (2014), and WTO (2018).

**Annex 2: Export Credit Agencies and EXIM Banks in Asia and the Pacific**

ADB Subregion	Economy (S&P Credit Rating <sup>a</sup> )	Name	Year Founded	Ownership	Berne Union Member	Homepage	Economy's Income Group by World Bank
Central and West Asia (4/10)	Armenia (B1 by Moody's)	Export Insurance Agency of Armenia (EIAA)	2013	state-owned	Yes	www.eia.am	Upper-middle
	Kazakhstan (BBB-)	Kazakh Export Credit Insurance Corporation (KAZAKHEXPORT)	2003	state-owned	Yes	www.keg.kz	Upper-middle
		Eximbank Kazakhstan	1994	publicly owned	No	www.eximbank.kz	
	Pakistan (B-)	EXIM Bank of Pakistan	2015	state-owned	No	eximbank.gov.pk	Lower-middle
	Uzbekistan (BB-)	National Export-Import Insurance Company (UZBEKINVEST)	1994	state-owned	Yes	www.uzbekinvest.uz	Lower-middle
East Asia (5/6)	Hong Kong, China (AA+)	Hong Kong Export Credit Insurance Corporation (HKEC)	1966	state-owned	Yes	www.hkeci.com	High
		People's Insurance Company of China (PICC)	2002	state-owned	Yes	www.picc.com.cn	
	Republic of Korea (AA)	Korea Trade Insurance Corporation (KSURE)	1992	state-owned	Yes	www.ksure.or.kr	High
		Export-Import Bank of Korea (KEXIM)	1976	state-owned	No; export credit agency by OECD	www.koreaexim.go.kr	
	Japan (A+)	Nippon Export Investment Insurance (NEXI)	2001	state-owned	Yes	www.nexi.go.jp	High
		Japan Bank for International Cooperation (JBIC)	1999	state-owned	No; export credit agency by OECD	www.jbic.go.jp	
	PRC (A+)	China Export & Credit Insurance Corporation (SINOSURE)	2001	state-owned	Yes	www.sinosure.com.cn	Upper-middle
		The Export-Import Bank of China	1994	state-owned	No; export credit agency by Asian Exim Banks Forum	www.eximbank.gov.cn	
	Taipei, China (AA-)	Taipei Export-Import Bank of China (Eximbank)	1979	state-owned	Yes	www.eximbank.com.tw	High

continued next page

## Annex 2: Continued

ADB Subregion	Economy (S&P Credit Rating <sup>a</sup> )	Name	Year Founded	Ownership	Berne Union Member	Homepage	Economy's Income Group by World Bank
South Asia (2/6)	India (BBB-)	Export Credit Guarantee Corporation (ECGC)	1957	state-owned	Yes	www.ecgc.in	Lower-middle
		Export-Import Bank of India	1982	state-owned	No	www.eximbankindia.in	
	Sri Lanka (B)	Sri Lanka Export Credit Insurance Corporation (SLECIC)	1978	state-owned	Yes	www.slecic.lk	Lower-middle
Southeast Asia (5/10)	Indonesia (BBB-)	PT. Asuransi Asei Indonesia	1985	99.998% owned by Indonesia-Re	Yes	www.asei.co.id	Lower-middle
		Indonesia Eximbank	2009	state-owned	Yes	www.indonesiaeximbank.go.id	
	Singapore (AAA)	Enterprise Singapore	1983	state-owned	Yes	www.enterprise.sg.gov.sg	High
	Malaysia (A-)	Export-Import Bank of Malaysia Berhad (MEXIM)	1977	state-owned	Yes	www.exim.com.my	Upper-middle
	Philippines (BBB)	Philippine Export-Import Credit Agency (PhilEXIM)	1977	state-owned	No	http://www.philexim.gov.ph	Lower-middle
	Thailand (BBB+)	Export-Import Bank of Thailand (THAI EXIMBANK)	1993	state-owned	Yes	www.exim.go.th	Upper-middle
Oceania (2/2)	Australia (AAA)	Export Finance and Insurance Corporation (EFIC)	1957	state-owned	Yes	www.efic.gov.au	High
	New Zealand (AA)	New Zealand Export Credit Office (NZECO)	2001	state-owned	Yes	www.nzeco.govt.nz	High

ADB = Asian Development Bank, OECD = Organisation for Economic Co-operation and Development, S&P = Standard & Poor's.

Note: Figures in the parentheses represent the number of countries with export credit agencies and the number of ADB regional members, respectively; as of April 2019; ADB's Pacific member countries have not established ECAs yet.

<sup>a</sup> Retrieved from Bloomberg.

<sup>b</sup> LT foreign issuer credit rating.

Sources: Export credit agency list – Berne Union (<https://www.berneunion.org/Members>) and OECD (<http://www.oecd.org/tad/xcred/eca.htm>) accessed in January 2019; and OECD; World Bank income classification found here: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>; homepages for each export credit agency.

**Annex 3: Use of Technology in Trade Facilitation and Trade Finance**

Technology/Description	Examples and Benefits
<p><b>E-commerce</b></p> <p>Opens markets to small and medium-sized enterprises (SMEs) by reducing barriers to entry in international trade</p>	<ul style="list-style-type: none"> <li>• In 2018, more than half of the transactions of Amazon’s buyers and sellers came from SMEs in the United States, “enabling around 50,000 small businesses to exceed \$500,000 in sales, and nearly 200,000 to exceed \$100,000” (Mayersen 2019).</li> <li>• Amazon’s 2017 Annual Report notes that more than 5 billion items worldwide were shipped through its Prime service for the year. More than half of these items were from third-party sellers including SMEs.</li> </ul>
<p><b>Cloud-based invoicing solutions</b></p> <p>Simplifies cross-border billing, increasing availability of transactional data</p>	<ul style="list-style-type: none"> <li>• Freshbooks, Billbooks, and Invoicera, cloud-based accounting software service, facilitate sending invoice to their clients and collecting payments.</li> <li>• Cloud-based invoicing allows businesses to prepare invoices anywhere within a few minutes. This also enables speed and convenience, as links to online payment channels may be included in the electronic invoice (Debitoor 2018).</li> </ul>
<p><b>Optical Character Recognition (OCR)</b></p> <p>Allows the computer to recognize texts from trade documents; removes paper from large parts of trade operations</p>	<ul style="list-style-type: none"> <li>• Intelligent OCR could increase productivity in certain tasks by as much as 50%, as well as reduce operational and compliance risks associated with tracking activities on paper (Dab et al, 2016).</li> <li>• Machine learning can increase the accuracy of software in recognizing texts.</li> </ul>
<p><b>Electronic bills of lading</b></p> <p>Removes paper from large parts of trade operations; instant document transfer shortens the payment cycle and thus improves exporters’ working capital position</p>	<ul style="list-style-type: none"> <li>• Electronic bills of lading (B/L) serviced by Bolero and CargoDocs allows forwarders, authorized agents, and terminals to generate an acceptable form for tax and customs authorities.</li> <li>• Paper B/L usually delays the shipping process and forces the consignee to incur fees such as demurrage fees, or extra storage charges for depositories in the ports (Inter-Lawyer 2003). The process of issuing paper B/L represents around 10% of the goods’ values. These costs are avoided by using electronic B/L.</li> </ul>
<p><b>Distributed ledger technology such as blockchain</b></p> <p>Ensures that the stored data is kept secured when transmitted or stored electronically, building trust between trading entities</p>	<ul style="list-style-type: none"> <li>• HSBC and ING carried out the first LC transaction via blockchain in May 2018. It took less than 24 hours to complete—a significant improvement compared to the 5–10-day standard set by conventional paper-based transactions (HSBC 2018b).</li> <li>• The Hong Kong Monetary Authority (HKMA), together with twelve major banks in Hong Kong, China, launched a blockchain-based trade finance platform (eTradeConnect; formerly HKTFP) in October 2018 (HKMA 2018).</li> <li>• Sawtooth applies the digital ledger technology to the value chain of perishable goods such as seafood. All information on fish from ocean to customers are recorded in an immutable form.</li> </ul>
<p><b>Artificial Intelligence (AI) and big data</b></p> <p>Enable efficient process and productivity monitoring; predictive analytics to detect patterns; identify and block suspicious transactions</p>	<ul style="list-style-type: none"> <li>• AI-powered engine with OCR and biometrics facilitate banks’ know-your-customer (KYC) processes in a more efficient and accurate manner through automation. One bank noted that their usual 18-minute KYC process was shortened to a minute, increasing the KYC processing scale by more than 800,000 documents a day (Ernst &amp; Young n.d.).</li> <li>• In 2014, eBay introduced eBay Machine Translation, an in-house machine learning system that “translates between languages when users search or view listings on its website” to facilitate cross-border e-commerce.</li> <li>• Alibaba’s Smart Audit technology uses machine learning and AI, contributing to serving SMEs in international trade by providing order decision reports, terms/credit/trade risk reports, and solutions for preparing and auditing documents.</li> </ul>

continued next page

**Annex 3: Continued**

Technology/Description	Examples and Benefits
<p><b>Single window</b></p> <p>Allows parties involved in trade to lodge standardized information and document with a single entry point</p>	<ul style="list-style-type: none"> <li>• In the Republic of Korea, the introduction of its single window led to \$18 million in benefits in 2010, while Singapore's single window called TradeNet earned their customs office \$1 for every 1 cent spent (UNECE n.d.).</li> <li>• Since its implementation, the Association of Southeast Asian Nations Single Window has been making efforts to migrate administrative procedures to paperless forms to reduce costs and processing times (Viet Nam Customs n.d.).</li> </ul>
<p><b>Internet-of-things and global positioning system</b></p> <p>Transfers data across the worldwide web with minimal human intervention and performs analytics using collected data which could be applied to business such as geo-location of shipments</p>	<ul style="list-style-type: none"> <li>• Pathfindr Locate offers real-time location systems for indoor and outdoor asset location, temperature logging, and utilization analysis. It facilitates transport maintenance, tracking, and route optimization (Mitchell n.d.).</li> <li>• Trucks and trains moving between the People's Republic of China and Europe increasingly utilize satellite tracking, sensors (e.g., to track interior temperature of container, or to monitor the level of fuel) and smart locks to detect unauthorized opening of container door for high-valued cargo (Andy Sze, pers. comm.).</li> </ul>
<p><b>Application programming interfaces (API)</b></p> <p>Allows different software programs to connect, enabling their interoperability and communication with each other.</p>	<ul style="list-style-type: none"> <li>• APIs can be used for automated change and reporting of data including information exchange with regulators.</li> <li>• APIs are widely used in open banking and enables developers to build applications and services around financial institutions. This allows banks' customers to share their personal financial information with third parties to create new services and products. In Asia, open banking is operational in Hong Kong, China; Malaysia; the Republic of Korea; and Singapore (Fong 2018).</li> </ul>

Source: ADB compilation.

## **Asia–Pacific Trade Facilitation Report 2019**

*Bridging Trade Finance Gaps through Technology*

Trade facilitation initiatives can make an important contribution to economic growth and poverty reduction by lowering trade costs and increasing trade flows. This report reviews trade facilitation progress in Asia and the Pacific, including recent trends in paperless trade and transit facilitation and the impact of trade facilitation initiatives on trade costs. It also features a special chapter on how trade finance gaps—especially prevalent for small and medium-sized enterprises—can be bridged by technology, and the supporting policies and actions required to make this happen.

### **About the United Nations Economic and Social Commission for Asia and the Pacific**

ESCAP is the regional development arm of the United Nations and serves as the main economic and social development center for the United Nations in Asia and the Pacific. Its mandate is to foster cooperation between its 53 members and 9 associate members. ESCAP provides the strategic link between global and country-level programs and issues. It supports governments of countries in the region in consolidating regional positions and advocates regional approaches to meeting the region’s unique socioeconomic challenges in a globalizing world. The ESCAP headquarters is in Bangkok, Thailand.

### **About the Asian Development Bank**

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.



### **ASIAN DEVELOPMENT BANK**

6 ADB Avenue, Mandaluyong City  
1550 Metro Manila, Philippines  
[www.adb.org](http://www.adb.org)