



Report

Regional infrastructure for trade facilitation

Impact on growth and poverty reduction

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The report brings together the findings of a literature review and six background papers around three clusters of investigation.

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Acronyms and abbreviations

ADB	Asian Development Bank
AfT	Aid for Trade
AMU	Arab Maghreb Union
ASEAN	Association of South-East Asian Nations
ASYCUDA	Automated System for Customs Data
AVE	<i>Ad Valorem</i> Equivalent
BBIN	Bangladesh, Bhutan, India and Nepal
BoU	Bank of Uganda
CBO	Community-Based Organisation
CCRED	Centre for Competition, Regulation and Economic Development
CIA	Central Intelligence Agency
COMESA	Common Market for East and Southern Africa
DFID	Department for International Development
DRC	Democratic Republic of Congo
EAC	East African Community
EAGC	Eastern Africa Grain Council
EAP	East Asia and the Pacific
EASSI	Eastern African Sub-Regional Support Initiative for the Advancement of Women
EC	European Commission
ECA	Europe and Central Asia
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
EFTA	European Free Trade Area
ESA	Eastern and Southern Africa
ESCAP	Economic and Social Commission for Asia and the Pacific
EU	European Union
FAO	Food and Agricultural Organization
FDI	Foreign Direct Investment
FSD	Financial Sector Deepening
GDP	Gross Domestic Product
GVC	Global Value Chain
GIS	Geographic Information System
ICT	Information and Communications Technology
IFC	International Finance Corporation
IMF	International Monetary Fund
IRTU	International Road Transport Union
ISRT	Interstate Road Transport
KENFAP	Kenya National Federation of Agricultural Producers
LAC	Latin America and Caribbean
L/C	Letter of Credit
LCR	Local Content Requirement
LPI	Logistics Performance Index
LSCI	Liner Shipping Connectivity Index
MENA	Middle East North Africa
MSMEs	Micro, Small and Medium Enterprises
MT	Metric Tonne
MVA	Motor Vehicles Agreement

NA	North America
NAFTA	North American Free Trade Agreement
NCPB	National Cereals and Produce Board
NGO	Non-Governmental Organisation
NTB	Non-Tariff Barrier
NTM	Non-Tariff Measure
OECD	Organisation for Economic Co-operation and Development
OSBP	One-Stop Border Post
PPP	Public-Private Partnership
RATES	Regional Agricultural Trade Expansion Support Program
RATIN	Regional Agricultural Trade Intelligence Network
RCTG	Regional Customs Transit Guarantee
REC	Regional Economic Community
RITF	Regional Infrastructure for Trade Facilitation
RTA	Regional Trade Arrangement
SA	South Asia
SAARC	South Asian Association for Regional Cooperation
SADC	Southern African Development Community
SEA	South-East Asia
Sida	Swedish International Development Cooperation Agency
SMEs	Small and Medium-Sized Enterprises
STR	Simplified Trade Regime
TEU	20-Foot Equivalent Unit
TFI	Trade Facilitation Indicator
TFP	Total Factor Productivity
TIR	International Road <i>Transport</i>
UBOS	Uganda National Bureau of Statistics
UK	United Kingdom
UN	United Nations
UNCTAD	UN Conference on Trade and Development
UNECA	UN Economic Commission for Africa
UNECE	UN Economic Commission for Europe
UN-Habitat	UN Human Settlements Programme
US	United States
USAID	US Agency for International Development
USTR	US Trade Representative
VAT	Value-Added Tax
WAEMU	West African Economic and Monetary Union
WBES	World Bank Enterprise Survey
WCA	Western and Central Africa
WDI	World Development Indicators
WDR	World Development Report
WRS	Warehouse Receipt System
WTO	World Trade Organization

Glossary of technical terms

Agglomeration benefits	The benefits obtained by locating near each other: lower transaction costs, knowledge spillovers and the effects of market size
Centrifugal forces	Forces incentivising the dispersion of activities across space
Centripetal forces	Forces leading to the consolidation of activities in space
Hard infrastructure	Includes roads and railways
Hub-and-spoke distribution	Inspired by airline systems in which local airports offer flights to a central airport where international or long-distance flights are available
Regional infrastructure	Any kind of infrastructure that allows for connecting economic actors (e.g. firms, households) along defined regional markets to regional and other international markets
Regional integration	Refers to the process by which states within a particular region increase their levels of interaction with regard to economic, political, security, social and cultural matter/issues
Soft infrastructure	Includes public sector reforms such as non-tariff standards, customs procedures and competitive transport services
Spatial arbitrage	The ability to exploit differences in characteristics across space (e.g. prices)

Executive summary

The expectation by policymakers that regional infrastructure for trade facilitation (RITF) will help growth and poverty reduction is well founded in theory but has not been matched by clear evidence from the evaluation and research communities.¹ The research undertaken for this project contributes to the body of research inspiring better evaluation and policies related to RITF. It unpacks infrastructure distinguishing among different types, such as physical and regulatory infrastructure. In particular, it provides more evidence of the complementarities between both types of infrastructure to ensure pass-through of the benefits of the reduction in trade costs to poor producers and consumers.

The approach used in the report is to provide evidence on the impact of regional infrastructure and associated trade cost reduction on the behaviour, risks and opportunities of economic actors (households, firms) through direct and indirect routes. It does this by creating and using new infrastructure measures; undertaking original surveys and new regressions; and developing and testing a new theory of change.²

The report first highlights the relevance of focusing on the regional dimension. The traditional reasons are of course to tackle geographical constraints by bringing together many small economies and landlocked countries. But other reasons justify a focus on the regional dimension. These include the fact that international production networks are often centred around regions. Also, regionally traded goods and their related activities are more employment-intensive than goods traded further away. However, addressing infrastructure (hard and soft) at the regional level is not without challenges. A range of vested interests and other political economy considerations exist in dealing with both hard and soft infrastructure for trade facilitation at the regional level, such as: (i) appropriation of benefits versus costs of investing in hard infrastructure regionally; (ii) appropriation of benefits by intermediaries and competition in logistic services; and (iii) the challenge of addressing non-tariff measures.

The report then explores new evidence following three clusters, each of which examines a different dimension of the importance of RITF. Each cluster gathers evidence of pathways of impacts in broad terms and then considers specific examples of impacts on poverty as well as complementary measures that can help ensure the reduction in trade costs benefits and trickles down to the poor.

¹ For example, a recent Independent Commission for Aid Impact report that evaluated the impact of a UK Department for International Development trade facilitation programme in Southern Africa had very little research to draw on. Choosing to rely on one of the few analyses particularly emphasising potential negative impacts on the poor, and especially one specific *ex-ante* modelling exercise and a handful of interviews, it reached the conclusion that there was not enough proof about the impact of the poverty reduction impact of the programme, and that this impact could potentially be negative.

² The background papers include:

Cadot, O., Himbert, A. and Jouanjean, M.-A. (2015) 'Trade Facilitation and Concentration – Evidence from Sub-Saharan Africa'. ODI Report.
De, P. (2015) 'Disentangling transit costs and time in South Asia – Lessons from firms in Bhutan and Nepal importing through Kolkata and Haldia ports'. ODI Report.

Engel, J. and Jouanjean, M.-A. (2015) 'Infrastructure to Improve Market Integration of Smallholders and Address Coordination Failure in Food Staples Value Chains – Lessons from the Kenyan Maize Value Chain'. ODI Report.

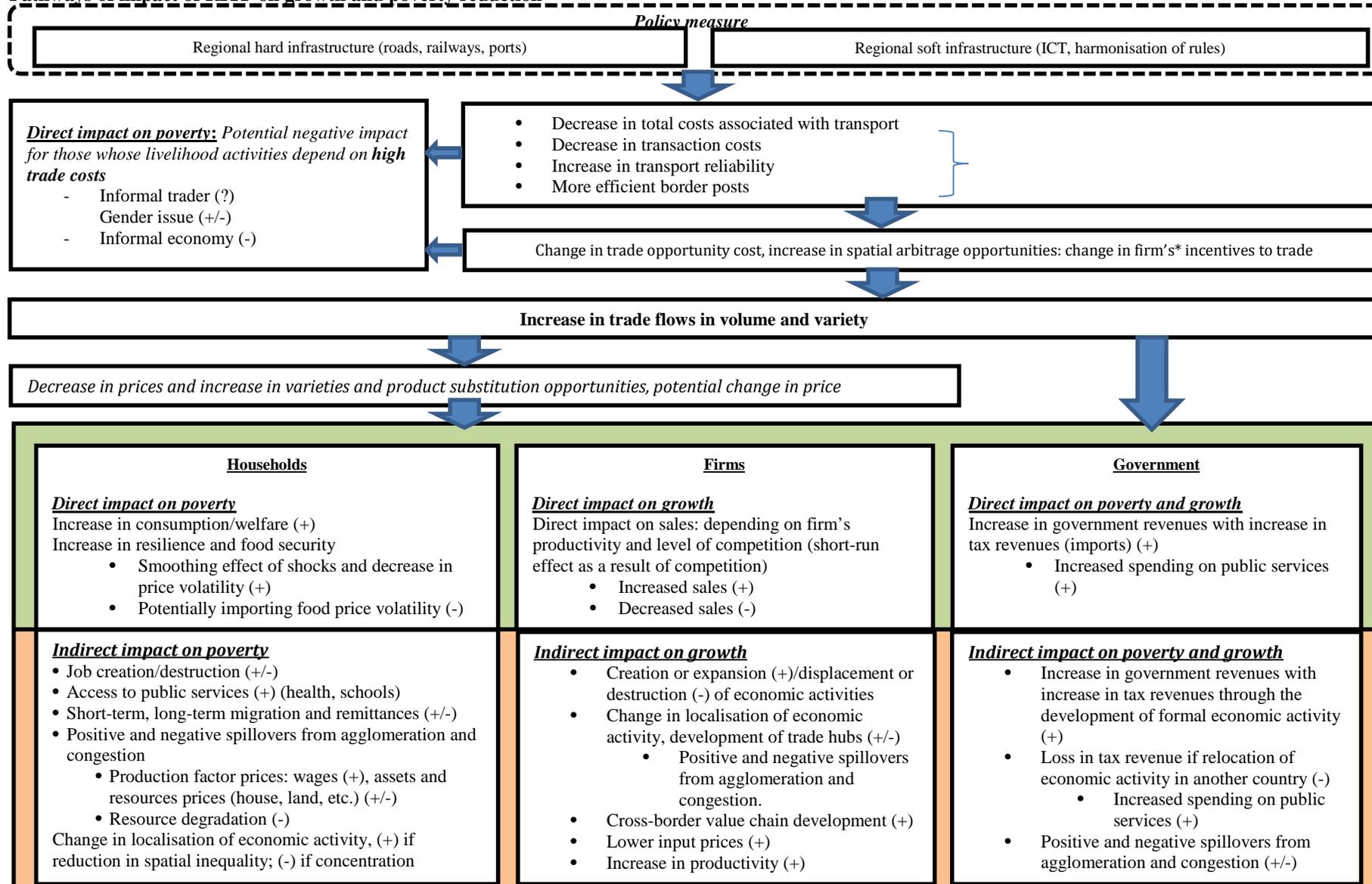
Jouanjean, M.-A., Gachassin, M. and te Velde, D.W. (2015) 'Regional Infrastructure for Trade Facilitation – Impact on Growth and Poverty Reduction – a Literature Survey'. ODI Report.

Tyson, J. (2015) 'Effect of Sub-Saharan African Trade Corridors on Vulnerable Groups'. ODI Report.

Shepherd, B. (2015) 'Infrastructure, Trade Facilitation, and Network Connectivity in Sub-Saharan Africa'. ODI Report.

Te Velde, D.W. (2015) 'Regional Trade and Infrastructure and Firm-level Productivity in Sub-Saharan Africa'. ODI Report.

Pathways of impact of RITF on growth and poverty reduction



A typology of research methodology and findings

Cluster	Channel of impact on growth and poverty reduction
Cluster 1 <i>Impact of cross-border infrastructure on economic activity at the border and along trade corridors</i>	RITF for spatial growth patterns Measure of RITF: Corridors and LPI Channel of impacts: Better RITF affects location of economic activity Links to impacts identified in theory of change (on impact and risks): Job creation/destruction (+/-); Access to public services (+) (health, schools); Short-term, long-term migration and remittances (+/-); Positive and negative spillovers from agglomeration and congestion (Production factor prices: wages (+); Assets and resources prices (house, land, etc.) (+/-); Resource degradation (-); Change in localisation of economic activity, (+) if reduction in spatial inequality, (-) if concentration) Main likely impact: Reduction in spatial inequality Main policies to address risks and increase benefits: - Developing secondary road networks, ICT infrastructure and health and education infrastructure - Supporting complementary policies to support access to public services
	RITF for job opportunities and livelihoods of informal cross-border economic actors Measure of RITF: Cross-border infrastructure – OSBPs Channel of impacts: New cross-border infrastructure affects informal activities of households at the border Links to impacts identified in theory of change (on impact and risks): Informal trader (?); Gender issue (+/-); Informal economy (-) Main likely impact: Better conditions for informal traders Policies to prevent the risks and increase benefits: - Taking into account the specificity of informal traders in the conceptualisation of cross-border infrastructure
Cluster 2 <i>RITF for participation in value chains and integration in international production networks</i>	RITF for GVC integration Measure of RITF: Five infrastructure and trade facilitation variables <ol style="list-style-type: none"> 1. Infrastructure component of LPI 2. Liner Shipping Connectivity Index produced by UNCTAD 3. World Bank's Air Connectivity Index 4. Road network density from CIA World Factbook 5. OECD TFIs Links to impacts identified in theory of change (on impact and risks): Creation or expansion (+)/displacement or destruction (-) of economic activities; Cross-border value chain development (+); Lower input prices (+); Increase in productivity (+); Job creation/destruction (+/-) Main likely impact: RITF matters for GVC integration Policies to prevent the risks and increase benefits: - Support for a regional approach to infrastructure development - Complementary training to prepare firms for competition and entry into GVCs
	RITF for smallholder participation in local and regional value chains Measure of RITF: Provision of warehouses, warehouse services and regulation for the maize value chain Links to impacts identified in theory of change (on impact and risks): Increase in consumption/welfare (+); Increase in resilience and food security (+); Smoothing effect of shocks and decrease in price volatility (+) Main likely impact: Integration of smallholders in local and regional value chains Policies to prevent the risks and increase benefits: - Complementary regulatory framework to address coordination failure in the value chain

Cluster 3 <i>RITF for the productivity of firms and efficiency of logistics services</i>	RITF for the productivity of firms Measure of RITF: Regional infrastructure indicators using LPI; regional trade Links to impacts identified in theory of change (on impact and risks): Lower input prices (+); Increase in productivity (+); Job creation/destruction (+/-) Main likely impact: RITF and regional exporting associated with higher firm-level productivity Policies to prevent the risks and increase benefits: - Support for a regional approach to infrastructure development will have long-lasting effects though exporting and importing - Complementary policies are required to reduce costs of border crossings but also to reduce the dispersion in the costs faced by different firms for the same gateway
	RITF and the efficiency of logistics services Measure of RITF: Corridors, transit agreements, logistics services Links to impacts identified in theory of change (on impact and risks): Direct impact on sales (depending on firm's productivity level) Increased sales (+); Decreased sales (-); Creation or expansion (+)/displacement or destruction (-) of economic activities; Cross-border value chain development (+); Job creation/destruction (+/-) Main likely impact: Efficient logistic services are important to ensure that effect is passed through to all economic agents Policies to prevent the risks and increase benefits: - Addressing localisation barriers preventing efficient regional logistic services

The research undertaken shows investment in RITF enhances economic activity around the border, thereby reducing spatial inequalities within African countries. It also supports the activity of the informal sector at the border, in particular informal traders. But to increase the benefits, the design of cross-border infrastructure should take into account their specific characteristics. There are, however, potentially negative effects on the livelihoods of the most vulnerable, for whom specific initiatives can support adaptation to the new economic environment. RITF also facilitates integration into modern value chains and international production networks. Finally, RITF has positive impacts on the productivity of African firms.

The pass-through of the effect of new hard infrastructure to economic actors occurs only when complementary regulations allow for efficient trade logistic services. In particular, innovative regulations and infrastructure should address coordination failures in modern value chains and tackle obstacles such as localisation barriers to reduce competition in the logistics sector. Taken together, the evidence suggests most of the impacts on growth and poverty reduction are indirect and require an understanding of constraints to connectivity throughout value chains. Hence, policymakers should take greater care of accounting for these in policy decisions and evaluations of RITF.

We summarise the impact and risks of RITF in terms of growth and poverty reduction as well as the poverty implications around three major findings.

1) RITF encourages economic activity around the border, including for most informal traders

New econometric analysis focusing on African countries finds the facilitation of trade across borders leads to a greater spatial spread of economic activity, suggesting trade facilitation projects are valuable not just for their growth effects but also for their spatial effects and potential reduction in urban pressures.

A new survey around the one-stop-border-post (OSBP) recently built in Busia (on the Kenya–Uganda border) finds mostly beneficial effects (smoother cross-border trading with reduction of harassment, for instance, supporting more cross-border trading), even for directly affected informal traders and households. However, there can be some specific negative short-term impacts for informal workers whose economic activity depends on inefficiencies of border crossing (e.g. a decline in hand-sorted trade).

In order to increase the benefits, policymakers need to recognise the specific characteristics of informal traders in the design of RITF that have traditionally aimed at facilitating formal trade across borders. Further, they need to

implement complementary policies to support and sustain the effects on the reduction of spatial inequalities, such as investment in rural areas and small urban centres to support the participation and access of rural populations to the market and increase access to health and education services to address the needs of vulnerable groups.

2) RITF helps firms in African countries connect to modern value chains and in particular global value chains

New econometric analysis finds a clear positive association between infrastructure for trade facilitation and connectivity to international production networks, particularly in textiles and clothing. There is a strong positive association between infrastructure and trade facilitation improvements in neighbouring countries and greater value chain connectivity at home. It is, therefore, not just what a country does that matters for its connectivity, but also what its neighbours do.

Recognising this new evidence, policymakers should improve infrastructure and trade facilitation performance, for instance through implementation of the World Trade Organization Agreement on Trade Facilitation. They should also adopt a regional approach to infrastructure development, consistent with the recent emphasis on economic corridors.

A new case study example in Kenya illustrates how warehouses are specific examples of infrastructure with great potential to unlock coordination failures in the development of inclusive local and regional modern value chains. This case highlights the importance of treading the final mile for poverty reduction and recognising the complementarity within hard infrastructure (between roads and warehouses) and between hard and soft infrastructure (warehouses and complementary regulations such as standards and laws stating contractual responsibilities) to support the participation of poor producers in modern national and regional value chains.

3) RITF has long-lasting effects through productivity of firms

New empirical analysis based on firm-level data suggests firms in countries with better regional infrastructure (reflected in the quality of infrastructure in their neighbours) also have relatively higher productivity. The productivity-enhancing effects of regional infrastructure are shown to come through importing material inputs and supplies, but also through exporting. The empirical analysis based on firm-level panel data in Malawi, Rwanda, Senegal and South Africa shows regional exporters not only have higher productivity than other non-exporting firms (the average productivity gap between regional exporters and other firms ranges from 18% in Malawi to 60% in Senegal and 72% in Rwanda) but also experience greater productivity growth (reflected in faster growth in labour productivity in both Malawi and Rwanda) and more rapid total factor productivity growth in Senegal. Regional exporters put greater emphasis on technology, which leads to higher productivity and better product quality.

We find evidence of significant variation in transaction costs associated with the use of regional infrastructure. We show, using data from the World Bank's Enterprise Surveys and a new case study in Bhutan, India and Nepal, that clearing costs can vary markedly between border crossings, but also across different types of exporters using the same crossing. The implication of these findings is that policymakers should take into account the role of the soft regional infrastructure environment in determining border costs in addition to hard regional infrastructure when investing in upgrading regional infrastructure.

Ensuring investments in regional infrastructure allows small producers and traders to access regional markets and integrate in modern value chains. But it also requires institutions and regulations enabling transparent and competitive domestic and regionally integrated services markets. The report also lists a range of barriers that hamper the efficiency of trade logistic services, which in turn reduces the impact of new hard infrastructure, in particular in the context of transit agreements. Addressing those barriers (from licensing and service restrictions to labour regulations) is essential to make sure the reduction in trade costs benefits all economic actors, from firms (through lower export and import costs and increases in variety) to consumers (through a reduction in prices and increases in variety).

Overall, the risks for the poor are not very different from the risks introduced by trade liberalisation. The theory of change clearly highlighted these potential impacts. However, infrastructure investment completed by a specific support and regulatory environment is likely to unlock opportunities in a way trade liberalisation cannot. Therefore, addressing infrastructure and conceptualising complementary policies at the regional level can

potentially decrease negative impacts and increase efficiency compared with a country acting on its own. Coordination for investments in RITF is crucial in amplifying the positive benefits.

In particular, to secure a poverty reduction impact, the report also highlights the need for investments in specific types of infrastructure able to open up cross-border market opportunities for small-scale producers in lagging regions. Such infrastructure should enable connection to regional corridors. It can include consolidation facilities (e.g. warehouses), border markets or logistics platforms to facilitate market exchanges and minimise post-harvest losses, as well as dedicated channels and procedures facilitating small-scale cross-border trade flows. These types of interventions would tackle the major sources of costs for small-scale traders in areas with thin economic densities.

Summarising the new evidence of regional infrastructure on growth and poverty reduction

	Border activity (Cluster 1)	Value chain integration (Cluster 2)	Efficiency of customs and firm productivity (Cluster 3)
Evidence on impact	<p>Positive impact through influence on the location of economic activity (reduction in spatial inequality in regions close to the border).</p> <p>Positive impact on informal workers and traders with better work conditions and increased opportunities.</p>	<p>Regional infrastructure facilitates value chain integration.</p> <p>Warehouses and warehouse services illustrate the potential of complementary infrastructure to address coordination failures. Allow smallholder participation in modern value chains and let them 'move up' and capture margins previously caught by other players.</p>	<p>Efficient regional infrastructure and customs help regional exporting and importing. They also matter for domestic firms' productivity.</p> <p>Existence of a plethora of barriers to efficient logistic services reduces pass-through of the reduction of trade costs to economic actors throughout the chain.</p>
Risk to the poor	<p>Might be no impact or even a reversal of benefits without the development of secondary road networks, ICT infrastructure and health and education infrastructure.</p> <p>Some informal workers can lose out. Also potentially no or negative impact if the specificity of informal traders are not considered in the design and implementation phases.</p>	<p>No capacity for small firms to access the market and enter value chains without supporting services.</p>	<p>Import competition and regional export opportunities help those firms that can respond.</p> <p>There will be no impacts from the reduction in trade costs from RITF if it does not pass through to all economic actors and in particular the poor. Regulation preventing efficient logistic services can create rents.</p>
Policies to raise benefits to the poor	<p>Recognise specific characteristics of informal trading.</p> <p>Complementary infrastructure and policies to cover the 'final mile' with secondary road networks and transport services, ICT infrastructure and health and education infrastructure to sustainably reduce spatial inequalities.</p>	<p>Complementary policies (e.g. regulatory framework) and complementary services to address coordination failure and integrate small firms in the value chain.</p>	<p>Addressing barriers to entry and in particular localisation barriers decreasing the efficiency of logistic services.</p> <p>Find more efficient transit mechanisms for land locked countries.</p>

Policy implications

What can policy do to improve the impact of regional infrastructure for growth and poverty reduction?

The research suggests RITF is good for growth and productivity, but there are several ways in which policy can enhance these effects:

- Policy should focus not only on the quality of regional hard infrastructure, such as roads and ports, but also on other factors such as soft infrastructure, to increase transparency and the efficiency of trade-related services for all firms. In particular, it should focus on creating innovative regulations addressing coordination failure in the value chains.
- Policy should also remove barriers to efficiency of trade logistics services, in particular for transit, such as licensing and service restrictions, restrictions on the employment of labour, limitations on access to certain infrastructure facilities, cabotage restrictions, cargo reservation schemes and third country rules, or ownership and investment regulations.

Policy can also improve the impact of RITF for the poorest and reduce the risks they may face:

- Policy needs to help sustain the reduction in spatial inequalities from RITF by supplying complementary infrastructure such as rural feeder roads, but also health and education services. This could foster the development of new hubs of economic activity.
- It is important to design temporary programmes that could support those affected negatively by OSBPs and help them change to other types of activities.
- Better integration into international production networks is welcome, but complementary policy is needed to give smaller firms the opportunity to participate, directly or indirectly.

1. Introduction

The objective of this report is to understand the benefits and potential risks of upgrading regional infrastructure for trade facilitation (RITF) in terms of growth and poverty reduction and to suggest policy interventions that have the capacity to increase benefits for and mitigate potential harm to the poor. While there is agreement that infrastructure is essential to economic development, it is often hard to attribute the impact on growth and poverty. It can sometimes be ‘difficult to disentangle the effects on growth and poverty due to regional trade policies from those due to trade facilitation that could be undertaken on a regional or unilateral basis’ (de Melo and Tsikata, 2014). Analysis of trade liberalisation has often considered the importance of complementary policies to support losers and vulnerable populations, but projects aiming at reducing trade costs, and in particular investments in hard infrastructure such as roads, railways or cross-border infrastructure, have not.

While trade liberalisation and infrastructure development have often been considered in different ways, in practice the effects of reducing tariffs and making cross-border trade more efficient are similar. The current emphasis in development policy on trade costs makes the similarities between both types of interventions more striking, even more so when we consider that investing in infrastructure has potentially more impact on trade integration than tariff reduction does. In theory, both trade liberalisation and infrastructure for trade facilitation reduce trade costs and increase incentives for trade and competition, and affect prices and access to goods and services. So far, the impact of investments in trade facilitation on growth and poverty reduction has been assessed indirectly, by looking at the impact either on various pathways of impacts – trade costs, prices – or on specific outcomes related to growth and poverty reduction – such as households’ access to markets or foreign direct investment (FDI) (see Jouanjan et al., 2015).

This report defines regional infrastructure as any kind of infrastructure that allows economic agents (e.g. firms, households) to connect with regional and other international markets along a defined route. This definition encompasses modes such as regional roads and railways, as well as ports and airports, whenever they are connected to other countries in the region through a corridor and can potentially act as a hub linking the region to the international market.³ It includes obvious regional hard infrastructure, such as customs infrastructure at the border, but also other domestic hard infrastructure essential to guarantee physical connectivity at the regional level, such as warehouses. In addition, it covers soft infrastructure that affects goods traded across the border directly, such as regulations and policies (standards), and indirectly through its effect on logistics services, such as trucking, warehousing, customs clearing and freight forwarding.

The report makes use of the broad definition of trade facilitation, which in classical terms focuses more narrowly on border management. To do so, we identify both the importance of cross-border efficiency for the location of economic activity and the impact on small, poor and often informal traders, as well as other workers relying on cross-border trade activities. We also adopt a value chain analysis highlighting how hard and soft infrastructure affect the efficiency of stakeholders as well as their capacity and incentives to trade. We therefore highlight the important role infrastructure for trade facilitation plays in reducing transaction and trade costs and addressing coordination failures among value chain stakeholders. Our definition of trade facilitation therefore includes any behind-the-border barriers to trade that affect incentives to participate in markets and trade. Essential hard infrastructure or the provision of essential services inputs can address such behind-the-border constraints.

After setting our research in the context of previous work on the topic, this report provides new evidence of the importance of RITF on growth and poverty reduction and explores the following research questions:

- What is the evidence that improvements in regional infrastructure designed to increase cross-border trade in Sub-Saharan Africa (through reducing the costs of trade, including costs caused by delays

³ Infrastructure such as that associated with the Nacala Corridor (railway, road, port and cross-border infrastructure) linking the port of Nacala in Mozambique to Malawi and Zambia is therefore considered regional infrastructure. But such regional infrastructure also covers soft infrastructure influencing transport costs, ease of access and use of such corridors for neighbouring countries, for instance transit as well as standards regulations.

-
- principally in transport) result in poverty reduction (i) indirectly, as a result of economic growth; and (ii) directly?
 - What potential risks to the poor are created by trade growth resulting from improvements in regional infrastructure?
 - What policy interventions have the capacity to increase benefits for the poor and mitigate potential harm to the poor?

The structure of this report is as follows. The rest of this introductory chapter (starting with Section 1.1) first emphasises the relevance of the regional dimension of infrastructure for trade facilitation and then reviews evidence on the pathways of impact and impacts on households, firms and governments. It also introduces another specific type of actor: informal traders and workers at the border.

The review of previous analyses of the impact of infrastructure highlights that the literature rarely focuses on the regional dimension of infrastructure. This report fills this gap. Also, by adopting a value chain approach, the report puts infrastructure development at the centre of the new approach to regionalism (Baldwin, 2011), embedded in new trade analysis, which emphasises the importance of complementary measures to increase connectivity and address coordination failure along the value chain, from a domestic to a regional and finally a global perspective.

Box 1: List of background papers

Literature review:

- Jouanjean, M.-A., Gachassin, M. and te Velde, D.W. (2015) 'Regional Infrastructure for Trade Facilitation – Impact on Growth and Poverty Reduction – a Literature Survey'. ODI Report.

Cluster 1:

- Cadot, O., Himbert, A. and Jouanjean, M.-A. (2015) 'Trade Facilitation and Concentration – Evidence from Sub-Saharan Africa'. ODI Report.
- Tyson, J. (2015) 'Effect of Sub-Saharan African Trade Corridors on Vulnerable Groups'. ODI Report.

Cluster 2:

- Shepherd, B. (2015) 'Infrastructure, Trade Facilitation, and Network Connectivity in Sub-Saharan Africa'. ODI Report.
- Engel, J. and Jouanjean, M.-A. (2015) 'Infrastructure to Improve Market Integration of Smallholders and Address Coordination Failure in Food Staples Value Chains – Lessons from the Kenyan Maize Value Chain'. ODI Report.

Cluster 3:

- Te Velde, D.W. (2015) 'Regional Trade and Infrastructure and Firm-level Productivity in Sub-Saharan Africa'. ODI Report.
- De, P. (2015) 'Disentangling transit costs and time in South Asia – Lessons from firms in Bhutan and Nepal importing through Kolkata and Haldia ports'. ODI Report.

The rest of the report then draws on a series of commissioned research papers and case studies, with a focus on Sub-Saharan Africa as well as South Asia.

After the introduction (Chapter 1), identifying the pathways of impact of RITF on growth and poverty reduction and introducing various political economy concerns, the rest of the report explores new evidence following three clusters, each of which examines a different dimension of the importance of RITF. Each cluster gathers evidence of pathways of impacts in broad terms and then considers specific examples of impacts on poverty as well as complementary measures that can help ensure the reduction in trade costs benefits and trickles down to the poor.

The first cluster (Chapter 2) examines cross-border infrastructure. It investigates how the relative thickness of borders influences the location of economic activity and encourages the agglomeration of populations in urban centres and gateways (Section 2.1). Section 2.2 examines more specifically the effects of trade facilitation for actors at the border, in particular informal traders and workers, and considers options to guarantee and increase the benefits of upgrades in cross-border infrastructure.

The second cluster (Chapter 3) focuses on modern value chain integration. After emphasising the link between global value chains (GVCs) and employment generation, it provides evidence that RITF facilitates integration into modern value chains and international production networks. In particular, new econometric analysis finds a strong positive association between trade facilitation improvements in neighbouring countries and greater value chain connectivity at home. The case study focuses on the complementarity among different types of hard infrastructure (roads and warehouses) but also between hard and soft infrastructure, which makes it possible to reduce risk, increase investments in value chains by various stakeholders and smallholders and even upgrade the value chain. Focusing on the maize value chain in the East African Community (EAC) and in particular in Kenya, it also emphasises the potential for facilitating trade in agriculture as a way to increase smallholder participation in the market, boost income and, at the same time, enhance regional food security.

The third cluster (Chapter 4) provides evidence about the importance of RITF and, in particular, efficient trade logistics services for trade and the productivity of firms. It first shows that regional infrastructure affects firm productivity. It then explores barriers to efficiency in logistics services, with a particular focus on transit mechanisms to allow landlocked country firms to reap the benefits of investments in hard infrastructure.

1.1. The importance of regional infrastructure for trade facilitation

Addressing the issue of infrastructure development, and in particular infrastructure for trade facilitation in coordination with neighbouring countries, is likely to be more efficient than making unilateral investments. The following sections explore evidence on the importance of addressing infrastructure issues at the regional level. We first emphasise its role in regional integration in the new regional integration approach. We then emphasise the importance of regional connections for access of landlocked countries to the international market. However, although regions seem to be the relevant scale of action, this approach is not without challenges, in particular when it comes to benefit attribution and negotiating regulations at the regional scale. This suggests that it is important to correctly identify the most effective scale of intervention for regional integration processes. In some cases, regional institutions are limited in the extent they can drive change. They may also be overly ambitious in their integration plans. Hence, in some instances, it may be more efficient to apply the principle of subsidiarity and defer decision-making or negotiating tasks relating to RITF to smaller (even sub-regional) bodies when they have the capabilities and necessary clout to do so. This implies attention needs to be given to selecting the most effective level of aggregation for addressing particular policy issues related to RITF. The latter is beyond the scope of this paper and is left for future work.

1.1.1. The new regional integration approach

Regional integration as conceived in the 20th century was a linear process, with market integration following a stepwise approach, focusing first on reducing tariffs, then non-tariff measures (NTMs), leaving supply-side and behind-the-border constraints for later, deeper, integration commitments. While this resulted in successful examples of regional integration, this approach has nonetheless been challenged, for two primary reasons.

First, the regional integration process may proceed with different impacts at different levels of member country development. For instance, it is reasonable to think a free trade agreement will have a much different outcome in terms of an increase in trade flows according to the capacity of the member country to handle such an increase in a cost-effective way. Therefore, while tariff reduction is an important step towards regional integration and increasing opportunities for imports and exports, reducing tariffs alone is often not enough to unlock trade and competitiveness. Reaping the benefits of trade and trade liberalisation for growth and poverty reduction requires complementary policies, such as macroeconomic, education and labour market policies, and regulatory frameworks – but also infrastructure development (OECD, 2011). Supply-side constraints and behind-the-border barriers are often much more constraining and represent the most important impediment to trade, dwarfing the effect of tariffs as a constraint to trade and in particular as a constraint to integration in GVCs (Kowalski et al., 2015).

This leads to the second challenge to the traditional regional integration approach, which is the changing nature of global trade, as highlighted by Baldwin (2011), embedded in a ‘trade–investment–service nexus’, with regionalism now being more about regulation than about tariffs. The decrease in communication costs and the internationalisation of production networks and processes with trade in tasks have emphasised the importance of

low transaction costs for shifting goods, services, people and capital across borders. Successful integration can therefore no longer be measured according to the importance of tariff reduction and preferences but rather must account for barriers limiting not only the movement of goods and services but also investments across borders. The internationalisation of production networks and trade in tasks means goods are now crossing borders multiple times, making trade facilitation central to integration and upgrading in GVCs.

With this second unbundling, poor provision of infrastructure and logistics services has become an even more prevalent barrier to trade integration, giving new impetus to the financing of large infrastructure projects. However, while some of those constraints can be addressed unilaterally at the national level, countries in a geographical region often share competitiveness challenges. Initiatives to enhance connectivity at the regional level can often be more effective than purely national initiatives in addressing such costs. Such concerns have been at the centre of the regional Aid for Trade (AfT) agenda (OECD, 2011, 2014). In particular, the fact that African infrastructure development lags far behind that of other countries in the developing world (Ondiege et al., 2013), in addition to the specific geography of Africa, with 40% of its population living in landlocked countries, reinforces the developmental potential of improving infrastructure for trade facilitation.

Hard infrastructure is not a silver bullet, nor the only element necessary for the reduction of trade costs and an increase in the efficiency of trade logistics services. Recent studies on regional integration in Africa (see Jouanjean et al., 2015 for a literature review) emphasise that the focus has been on border measures, such as import duties; the supply-side constraints to economic integration that may have been more important have been left aside. The studies agree that a deeper integration agenda, which includes services, investment, competition policy and other behind-the-border issues and policies that affect logistics performance and the domestic cost of trading, is likely to result in more trade gains than is an agenda focusing on traditional trade policies and border measures. Policymakers should therefore give more attention to removing not only between- but also behind-the-border barriers to trade and supporting competitive services markets.

Looking more specifically at the issue of integrating and upgrading in GVCs, Stevens and Kennan (2013) highlight that, on a domestic or local scale, governments can do a great deal to support simple process upgrading. This includes creating an ‘enabling environment’ but also more targeted and proactive government support. While asking what additional contribution regional integration could play, they highlight that even supporting ‘simple process upgrading’ may have a cross-border dimension. For instance, some inputs may need to be imported from or via neighbours. The literature examining the dynamics of regional and global value chains clearly highlights that, ‘while domestic policies remain relevant, they might not be at the appropriate level to best harness the challenges of competitiveness within GVCs’ (Cattaneo et al., 2013: 9). More so, the regional dimension is considered essential to GVCs (OECD and WTO, 2013). Trade-integrated regions are more attractive to GVC lead firms for a number of practical reasons, including (Cattaneo et al., 2013):

- Reduction of the cumulative value of tariffs within free trade areas;
- Reduction of the administrative burden associated with rules of origin and the traceability of products;
- Harmonisation/mutual recognition of standards along the production chain; and
- Reduction of the thickness of the border at large, including customs and trade facilitation procedures.

Transport infrastructure is currently a major stumbling block in trade participation. Logistics infrastructure has been cited as the most important trade-related issue in GVC participation for firms in developing countries (OECD, 2014), with recent evidence from diverse sectors in Africa (horticulture, tourism, garments) suggesting incomplete infrastructure raises costs, reduces market participation (i.e. for perishable goods) and undermines firm competitiveness (Goger et al., 2014).

The capacity to embrace the behind-the-border dimension is one of the reasons behind the very heterogeneous success in regional integration across the world. In Asia, and in particular South-East Asia, ambitious regional integration programmes integrating comprehensive infrastructure development programmes, such as the Greater Mekong Sub-Region, have supported a remarkable reduction in regional trade costs and the development of cross-border production networks, which have been a salient feature of the recent economic development in the region. Such development has not materialised in Sub-Saharan Africa, where regional integration has not provided the impetus for integration into the global economy. In Sub-Saharan Africa, Regional Economic Communities (RECs) have also had ambitious commitment to increased regional integration. There has been considerable success in

removing tariffs on intra-regional trade in Eastern and Southern Africa but less so in Central and Western Africa, where only very limited amounts of trade cross borders with a regional tariff preference. Meanwhile, implementation has generally been slow and sometimes volatile, with instances of policy reversal. National objectives affecting both trade and domestic policies have often superseded regional integration objectives. Despite ambitious commitments on tariff and non-tariff barrier reduction, policymakers in REC member countries are still using them as safeguard mechanisms in times of crisis. For instance, import or export bans are still often implemented for food products (Engel and Jouanjean, 2014). Therefore, although trade policy is in theory decided at the regional level, national administrations apply agreements in a very flexible way (see Maur and Shepherd, 2015, for examples about the Economic Community of West African States (ECOWAS)).

One potential reason for this is that the impact of tariffs and a reduction in NTMs is undermined by other high costs of trading and by on-the-ground barriers constraining the operations of producers and traders and preventing increased investments in the development of cross-border value chains. In other words, the cost of policy reversal increases with deeper trade integration. Increasing physical connectivity of neighbouring countries may be a tool not only to decrease trade costs but also to support more stable regional integration commitments. Indeed, while the main focus of this report is on the reduction in trade costs through RITF, we also acknowledge that regional integration can affect transaction costs, investments and growth and poverty reduction through other channels. In particular, increased connectivity and interdependence of countries can foster lock-in of reforms and credibility for the private sector investment as well as reducing the risk of political and military tensions between countries (Schiff and Winters, 1998).

This has not prevented RECs from acknowledging the importance of addressing non-tariff barriers (NTBs), which are in any case still limiting trade prospects, and various mechanisms have been put in place to monitor and address these. For instance, the EAC established the NTB Monitoring Mechanism in 2007 to provide a systematic framework to identify, monitor and facilitate NTB elimination. However, despite engagement, many barriers remain in terms of addressing them.

1.1.2. Focusing on reducing trade costs regionally

The main role of infrastructure in facilitating trade is to decrease the cost of moving goods or services from one location (origin of production) to another (location of final consumption or further processing). A decrease in such costs can stem from reduced transport costs, thanks to the provision of connected and efficient transport networks ('hard' component), and from reduced transaction costs, thanks to the removal of intangible barriers of exchange ('soft' component). The evidence suggests it is important to consider both components in lowering the costs of trading in order to reach full integration of markets and economies.

Investments in regional hard infrastructure for trade facilitation such as roads or rail can support the reduction of transport costs, but they are not a sufficient condition to reduce transaction costs and make sure the benefits of freeing trade accrue efficiently across various stakeholders, in particular the poorest. Complementary behind-the-border soft infrastructure and policies that cover a full range of regulations, institutions and procedures have been identified by researchers and practitioners as essential, in particular to address barriers reducing the quality and efficiency of support and logistics services such as trucking, warehousing, customs clearing and freight forwarding (see Chapter 3 on warehouses and Chapter 4 on transit). These soft infrastructure elements interact with hard infrastructure components in complementary ways to facilitate trade and boost export performance in developing economies (Portugal-Perez and Wilson, 2012).

Yet, soft infrastructure for trade facilitation should encompass more than administrative border procedures to ensure the benefits trickle down to all economic actors. Ensuring that investments in regional infrastructure allow small producers and traders to access regional markets and integrate in value chains requires institutions and regulations enabling transparent and competitive domestic and regionally integrated services markets. The available evidence shows that, while investments in hard infrastructure reduce travel time and vehicle operating costs, they are not necessarily correlated with a reduction in effective transport services prices (Teravaninthorn and Raballand, 2009). Therefore, it is important to better monitor how investments in hard infrastructure impact economic actors by monitoring access to logistics services. For instance, reducing trade costs when barriers to entry in the transport sector still exist can simply result in increasing stakeholders' mark-up, creating rents and potentially ramping up the difficulties in implementing subsequent reforms. Various surveys, including the 2015 Organisation for Economic Co-operation and Development (OECD)-World Trade Organization (WTO) AfT

monitoring survey clearly highlight border procedures, transport infrastructure and NTMs, including standards, as the most important sources of trade costs for exports.

Arvis et al. (2013) estimate trade costs by region, highlighting that they are still important for all developing countries. While countries in South-East Asia have been successful in reducing them, other regions, such as South Asia and Sub-Saharan Africa, and in particular landlocked countries, still face very high trade costs. Among developing countries, South-East Asia is the region with the most comprehensive and deepest regional integration agreements. As Table 1 highlights, this results in some of the lowest regional *ad valorem* equivalent (AVE) trade costs, whereas Sub-Saharan Africa presents the highest.⁴

⁴ According to the WTO (2016a), ‘a tariff that is not a percentage (e.g., dollars per ton) can be estimated as a percentage of the price — the ad valorem equivalent’. AVE can also be estimated for any kind of barrier to trade.

Table 1: AVE of average regional trade costs

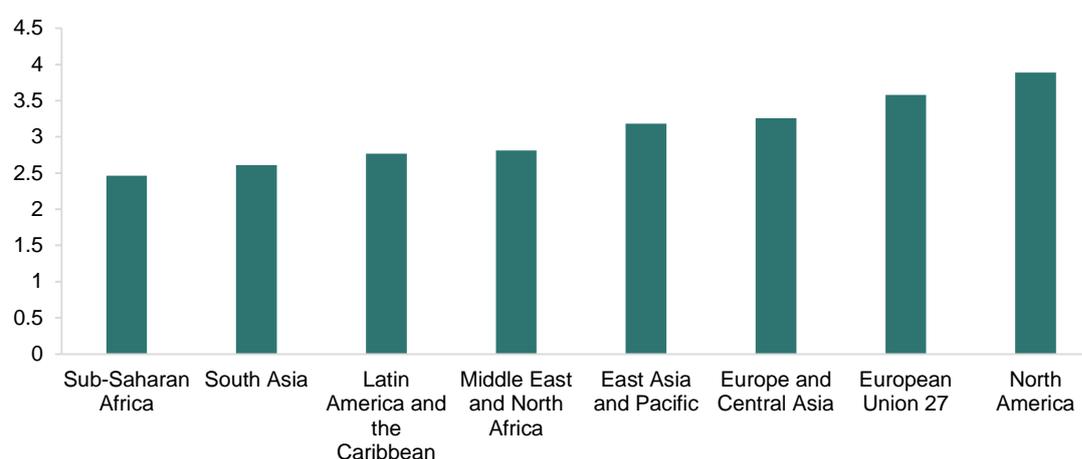
	EU	ECA	ESA	LAC	MENA	NA	SA	SEA	WCA
European Union (27)	34.3								
Europe and Central Asia	67.3	64.8							
Eastern and Southern Africa	112	146	103.7						
Latin America and Caribbean	109.5	158.4	186.2	93.6					
Middle East North Africa	76	109.4	91	135	48.3				
North America	65.5	102.6	125	92.3	72.2	14.8			
South Asia	94.8	136.5	161.9	183.8	60.8	88.6	92		
South-East Asia	88	119.5	155.1	127.9	69.4	71.9	103.6	68.8	
Western and Central Africa	106.7	168.2	93.7	123.7	112.4	105.4	99.6	162	104.3

Note: Figures show AVE of trade costs calculated from Arvis et al. (2013) using the trade cost measure proposed in Novy (2013). Data are trade-weighted average costs of trade by region for the year 2010.

Source: Kowalski et al. (2015), calculations based on ESCAP–World Bank Trade Cost Database.

Not surprisingly, the regions with the highest costs are also the regions presenting the lower average values on the World Bank’s Logistics Performance Index (LPI) (Arvis et al., 2014) This measures the quality of trade and transport-related infrastructure, and is based on a survey of international logistics professionals such as freight forwarders and express carriers.

Figure 1: LPI average score per World Bank region, 2014



Note: Average per region according to available data.

Source: World Bank LPI.

1.1.3. Why regional trade matters

Developing countries have been focusing on deepening regional integration for decades as a way to foster trade and investment and, consequently, growth. Regional integration is a way to support economies of scale and reallocation of resources, all of which result in improved competitiveness and the development of regional production networks, which in turn have proven to support international connectivity.

In Africa, the rationale was to tackle the continent’s geographical constraints, bringing together many small economies and landlocked countries. There is strong evidence from the literature that regional integration can support growth and economic development. According to the World Bank (2012), allowing more regional trade can make it possible to tackle key issues in Africa – diversifying away from a dependence on commodities and implementing policies that allow more people to participate in trade.

Regional integration and fostering intra-regional trade is important to support inclusive economic transformation, allowing at the same time for an increase in productivity and the fostering of job creation. Deeper integration has the potential to enhance productivity by facilitating access by firms (including micro, small and medium enterprises (MSMEs)) to services and skills, thereby allowing them to upgrade in domestic as well as international

value chains. In addition, regional trade, when including informal trade, tends to be more employment-intensive (Cattaneo et al., 2013; UNECA, 2015). It has been argued that there has been little scope for regional trade to drive African growth, as these countries share similar endowments and produce similar goods. However, the available evidence presents a very different story.

First, there is a great deal of opportunity in agricultural trade. Seasonality is one reason. For example, it is often said there is always a maize harvest going on somewhere in East Africa. As a result, millers in Kenya supply maize to produce flour all year round at different times in Kenya, Tanzania and Uganda. Also, in Africa, frontiers often separate natural market sheds linking surplus and deficit areas. Some countries have even started to develop cross-border agri-food value chains, for instance in animal feed for the poultry sector (see, e.g., Bagopi et al., 2014).

Second, intra-regional trade is much more diversified than extra-regional trade and often in sectors that are more employment-intensive. According to Stevens and Kennan (2013), ‘the continent’s exports are dominated by lightly processed primary products sold outside the region; yet there is also a vibrant intra-African trade – and lots of it’ (p.15). In fact, exports outside the region are concentrated on a few products but exported in large quantities. Goods traded within Africa are numerous but come in small quantities. Analysing trade in five RECs (the Arab Maghreb Union (AMU), the Common Market for Eastern and Southern Africa (COMESA), the Economic Community of Central African States (ECCAS), ECOWAS and the Southern African Development Community (SADC)), intra-REC exports tend to be more diverse than exports to other African countries. Further, intra-REC exports are more likely to consist of processed goods rather than primary commodities, unlike exports to non-REC members. In addition, with the exception of SADC, processed goods dominate the fastest-growing export products.

Increasing trade among African countries could improve diversification, as well as providing opportunities for learning, thereby promoting transformation for landlocked countries. While there is potential to increase trade unit values through upgrading trade with the global market, there is also scope to intensify trade within the region, which can play a vital role in diversifying African economies. This would make it possible to reduce dependence on exports of a few mineral products but also increase food and energy security and create jobs.

Evidence shows new opportunities are appearing in food and manufacturing sectors, particularly in relation to the increasing urban population. Trade in services also seems to be on the increase (Dihel and Grover, 2015 for health and education; UNECA, 2015), further supporting both the diversification of exports but also more competitive domestic services markets and, thereby, value chains. Accordingly, ‘functioning regional markets have become a springboard to markets in other continents’ (Brenton et al., 2013).

Regionally traded goods and their related activities are more employment-intensive than mining, for instance, which is still dominating extra-regional exports. Therefore, facilitating regional trade is likely to support more inclusive economic development and, ultimately, poverty reduction. It is also interesting to see that, in addition to food staples, informal cross-border trade often includes low-quality consumer goods such as clothes, shoes and electronic appliances (OECD, 2009). The scale of informal cross-border trade is one symptom of untapped trade potential. Facilitating cross-border small-scale trading is particularly important and has significant welfare implications for populations living in border areas (see Section 2.2). In addition, women often dominate such trade, and they frequently suffer from more challenging conditions when crossing the border, including a higher level of bribery as well as harassment.

1.1.4. Regional trade facilitation and landlocked countries

The regional focus for trade facilitation is of particular importance for landlocked countries. According to Naudé (2009), African countries experience a ‘proximity syndrome’ resulting from long distances to markets, the existence of many landlocked countries⁵ and suboptimal agglomeration patterns, which means there is a need to strengthen regional cooperation in infrastructure investment. According to Behar and Venables (2010), being landlocked increases trade costs by 50% and reduces trade volumes by 30-60%.

⁵ There are 15 landlocked countries in Africa: Botswana, Burkina Faso, Burundi, Central African Republic, Chad, Ethiopia, Lesotho, Malawi, Mali, Niger, Rwanda, Swaziland, Uganda, Zambia and Zimbabwe.

Regional integration can help alleviate the economic fragmentation caused by borders and integrate landlocked countries. However, as we have already highlighted, the actual impact depends on complementary policies and investments aimed at not only reducing physical trade costs but also allowing for the reduction to pass through to all economic actors by eliminating other barriers to trade within and between countries. Of particular importance for landlocked countries is transit regulation.

For Arvis et al. (2010), the complexity of transit regulation along corridors results in a ‘triple clearance’ time: for imports, the initiation of transit at the port of entry is as complicated as the clearance in the landlocked destination country, in addition to complicated transit controls at the border. The inefficiency of transit is also an incentive for traders to adopt inefficient trade routes. This is the example provided by McTiernan (2006), who reports that, because of transit fees in Benin and Togo, products are transported by ship between Lagos and Accra.

Overall, Yang and Gupta (2005) argue that landlocked countries could gain more from regional integration if they eliminate the remaining important NTBs to trade coastal countries impose, both administrative and physical. These barriers result in excessively high costs of transit and could be considered double taxation at entry. Chapter 4 further explores this specific issue.

1.1.5. Political economy of addressing regional hard and soft infrastructure

A range of vested interests and other political economy considerations exist in dealing with both hard and soft infrastructure for trade facilitation at the regional level. This is an integral part of the issue and, consequently, in this section we consider the issues of the appropriation of benefits versus costs of investing in hard infrastructure regionally; the appropriation of benefits by intermediaries and competition in logistics services; and the challenge of addressing NTBs.

Appropriation of benefits versus costs of investing in hard infrastructure regionally

Supporting RITF can face practical challenges, from the appropriation of benefits nationally to the implementation of regional initiatives that require multidimensional coordination mechanisms. Parties have to negotiate not only the design and level of investments but also the use of infrastructure by logistics services, financing modalities to recover maintenance costs and potential NTBs, all of which could reduce the use of the new infrastructure and returns to investments (see Chapter 4, which explores further the issue of localisation barriers to logistics services).

The benefits of regional infrastructure are maximised only if infrastructure developments are well synchronised across the border. There are many examples of failure to coordinate infrastructure across the border. One of them is the road between Malawi and Mozambique, which would have offered Malawi a short route to the port of Nacala. While the Malawi part of the road was built in the late 1990s, the Mozambican section is still to be improved. Other types of infrastructure, such as border markets or storage facilities, need to be done in pairs, to cater for changes in the direction trade flows across the border.

According to Maur (2008), regional cooperation is a way to ‘internalise the international externalities characterising infrastructure investments required to improve cross-border trade and maximise their social benefits’. This is also mentioned by Longo and Sekkat (2004), who highlight that, while infrastructure is a key factor in enhancing intra-regional trade, which may ensure a regional take-off in Africa, such investments are very costly. Taking into consideration positive spillovers from infrastructure, investment in neighbouring countries and coordinating investments through regional agencies might therefore be an effective strategy to avoid suboptimal levels of investment.

Appropriation of benefits by intermediaries and competition in logistics services

A lack of competition along different segments in the trade logistics chain can keep transport prices high for end-users. Trade logistics is a fertile ground for rent-seeking activities. The lobbying of interest groups and potential corruption can lead to inadequate regulation (such as market access restrictions and technical and customs regulations) that aims to protect inefficient logistics operators. It discourages the entry of more modern logistics operators with lower operational costs (Portugal-Perez and Wilson, 2012).

Tackling the governance and political economy of freight logistics is crucial to reduce transaction costs (see analysis from the Centre for Competition, Regulation and Economic Development (CCRED) on fertiliser trading and transportation in SADC: Nleya, 2014). Transport of freight between Sahel countries and their ports – and thus the world market – features prices that significantly exceed the underlying costs (Teravaninthorn and Raballand, 2009). This situation owes largely to rent-seeking road transport cartels that practise as if they were oligopolies.

Of particular concern is the trucking industry in West and Central Africa, which is characterised by cartels offering high prices and low service quality. The competitiveness of the East African market environment seems more mature, but is negatively affected by fuel prices and border controls. However, anti-competitive regulation also mars the most competitive trucking corridors of East Africa. For example, Kenya prohibits international transit trucks on the Mombasa–Kigali corridor from taking domestic freight on the return trip, forcing them to travel empty for 1,700 km (Cadot et al., 2015; see Chapter 4 for more evidence on this).

However, Raballand et al. (2010) highlight that a one-size-fits-all approach to the development of roads and transport services does not work. They argue the level of production influences which policies will be most effective: because of high risk and low returns, low agricultural production means low competition among truckers. Truckers need to cover their marginal costs, and in low-production areas this can already be difficult for a single trucker.

Porto et al. (2011) show that a lack of competition results not only in high costs of transport but also in poor services and inefficiencies, to the detriment of society as a whole. The US Agency for International Development (USAID) (2011) shows that the transport and logistics costs involved in moving maize and livestock along key trading corridors between Benin, Burkina Faso and Ghana account for approximately 59% and 18% of the respective end-market prices. Of these, transport costs – fees paid to transport service operators and losses in transit – are found to weigh most heavily on the end-market price along the corridors studied.

The challenge of addressing non-tariff measures – example of standards

Increasing the efficiency of cross-border trade requires addressing the issue of NTMs, especially sanitary and phytosanitary and technical barriers to trade. The effort to comply with production standards affects production costs. NTMs also affect trade costs through red tape, as well as through inspections and testing at the border, which can create delays for both imports and exports. There are two ways to address NTMs: harmonisation of and mutual recognition of standards – the latter is often recognised as a more feasible option compared with full harmonisation of standards (when all countries adopt exactly the same standards).

NTMs are a sensitive and complicated challenge for two reasons. The first is that separating legitimate measures (e.g. consumer safety) from protectionist ones would be particularly difficult, as the latter would have created rents and there would often be complex political economy dynamics. The second is that, in many cases, private standards are stricter and more burdensome and may also be more heterogeneous than public standards.

The issue of standards has been discussed extensively in the GVC literature. Some analyses show standards can prevent trade from occurring as they make it more difficult to enter high-quality value chains. They require higher investments and services, resulting in higher production costs. For others (e.g. Maertens and Swinnen, 2007, 2009), such standards have often been considered a catalyst rather than a barrier to trade, as they allow countries with poor standards, institutions and infrastructure to integrate high-value additions to value chains and, in particular, GVCs (see Chapter 3 for a discussion of standard harmonisation in the EAC).

Analysts mention concerns about the effects of the harmonisation in the EAC of regional quality standards for food staples with international standards in an effort to facilitate trade between member states and ensure global markets remain accessible to EAC exporters. In addition to the cost of harmonisation for producers, Keyser (2012) mentions that setting standards at a high level could negatively affect both small producers and poor consumers and disconnect them from regional and domestic markets. Furthermore, harmonisation of standards requires the identification of a benchmark, which is a highly political issue, particularly in the presence of rents but also because of fundamental differences in the approach to consumer safety (Engel and Jouanjean, 2015; Harris et al., 2011).

The complexity of the political dynamic is mentioned by Chambers et al. (2012), who provide the example of the harmonisation of axle load policy in ECOWAS. The issue of overloading is particularly important for trans-border shipments owing to significant variation in the engineered road tolerances by country. As a consequence, overloading can damage roads and trucks, generate safety concerns and increase travel time. Harmonised standards have been agreed at the regional level, but implementation is facing various collective action issues. For instance, the cost of compliance across actors and countries is asymmetric because of different baselines of prior regulation based on historical legacies (mostly in Francophone and Anglo-Saxon countries). In addition, the first movers to implement policies and regulations face the prospect of adverse impacts when it is not clear that others will comply.

1.2. RITF, growth and poverty reduction

1.2.1. Pathways of impact of RITF on growth and poverty reduction – evidence to date

The following section summarises the findings of a more extensive literature review (Jouanjean et al., 2015). One particular challenge is that the literature can be separated into roughly two groups: the first looks purely at the effect of trade facilitation on trade costs, trade flows and prices, but not specifically infrastructure, as it is often difficult to attribute the effect to one or another policy or piece of infrastructure; the second looks at the importance of infrastructure for growth and poverty reduction but without any specific indication about any regional dimension.

Figure 2 summarises the main transmission channels and pathways of impact of infrastructure for trade facilitation on growth and poverty reduction as identified by the theoretical and empirical literature. The first main step is to identify the policy measure being assessed, with RITF consisting of both hard and soft infrastructure. The nature of this measure depends on the regional and domestic political economy context. The second main step is to identify the direct impact of the policy measure on trade costs and trade flows. Finally, the third step looks at how a change in trade costs and trade flows affects three main types of actors (households, firms and governments). As cross-border infrastructure might have a particular impact on local populations where economic activity relates closely to cross-border trade, we introduce a fourth type of economic actor whose economic activity depends directly on high trade costs. We look at the impact on growth and poverty, through both direct and indirect channels such as lower prices, increased competition and product availability but also through increased income-generating opportunities.

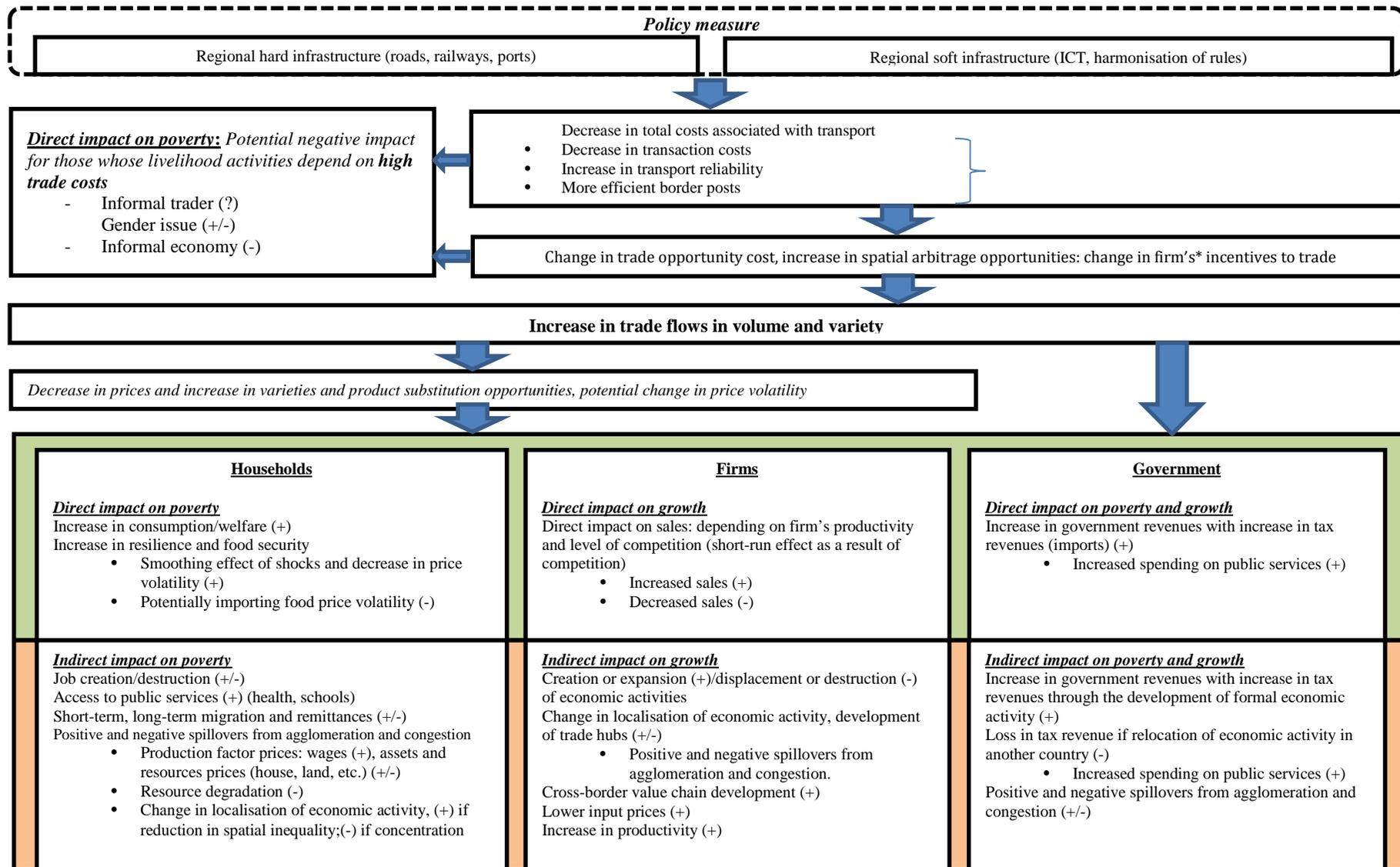
The main transmission channels between the provision of RITF and growth and poverty reduction relate to their impact on goods and services prices and trade flows through the effect on the reduction in trade costs (e.g. a decrease in transport and transaction costs, an increase in transport reliability and more efficient border posts), which changes the incentives to trade facing economic agents and reduces prices of goods and services. This effect on prices will trigger a range of direct and indirect changes, which, in aggregate, influence poverty and growth positively. The impacts encompass changes in the prices and volumes of trade in goods and services and will reduce the price of inputs and outputs, which can then have further knock-on effects on employment and access to social services.

Growth and poverty reduction are related. Even so, while evidence on the poverty effects is often examined through the effects on households, the growth effects are often investigated by looking at macroeconomic indicators and the effect on firms. The impact of infrastructure for trade facilitation on poverty has been assessed in many ways in the literature: through its impact on household welfare, food security and livelihood strategies and on health and education. The impact on growth is assessed through evidence on the level and location of economic activities, on FDI flows and, finally, on firm-level productivity.

Some indirect effects through government revenues and spending are envisaged, although evidence linking infrastructure for trade facilitation is scarce. Moreover, it is difficult to identify where this increase in revenue will be directed. Therefore, this report does not explore this channel further.

The following sections (1.2.2 to 1.2.4) draw from the literature review (Jouanjean et al., 2015) carried out as a background document for the RITF project. Please refer to this document for full acknowledgement of references supporting the conclusions.

Figure 2: Pathways of impact of RITF on growth and poverty reduction



1.2.2. The impact on trade flows and prices

A key building block in analysing the effects of regional infrastructure lies in identifying the effects on (i) trade flows and (ii) market integration (measured by the extent to which prices on either side of the border are equalised).

First, the literature suggests better hard transport and communication infrastructure lowers trade costs and raises trade flows. Further, while the livelihoods of some informal traders depend on trade restrictions and high trade costs, most, including women, would benefit from trade facilitation. Our project provides further evidence on this.

Second, good-quality regional infrastructure facilitates the movement of goods and services, and the transmission of information, across borders. Without any regional infrastructure, prices can evolve very differently in locations either side of the border. With good infrastructure, seamless borders and the transmission of information about prices, we can expect prices to evolve similarly, as traders are able to fully exploit the potential differences in availability and prices in different locations (spatial arbitrage) resulting in the equalisation of prices (controlling for transport cost). The evidence suggests there is indeed a significant border effect, with differences in price levels of around 13-20%, indicating opportunities for better regional infrastructure. Price differences for food staples are lower, presumably because these are traded informally. The presence of a border effect suggests there is scope for greater market integration, with research hinting that more efficient border posts allow for faster price transmission and hence better spatial arbitrage.

1.2.3. Infrastructure and poverty reduction

Infrastructure can affect poverty through a number of effects on households (welfare, food security, livelihood strategies, migration and health and education). The micro-level literature provides clear evidence that connectivity through transport infrastructure helps decrease poverty and increase welfare in Sub-Saharan Africa and elsewhere. Rural roads may allow farmers in remote and often poor rural areas to obtain higher prices for their output and/or reduce the prices of their inputs and consumer goods. However, it should be noted that much of the evidence focuses on national or subnational infrastructure and not cross-border infrastructure directly. When it comes to securing the benefits of regional corridors for small and medium-sized enterprises (SMEs), some emerging findings suggest regional infrastructure needs to be combined with the upgrading of feeder roads, storage facilities and access to credit. Our project provides further evidence on this.

By reducing trade costs and connecting areas of surplus and deficit for food staples, for instance, RITF can enhance economic resilience, reduce food insecurity through greater market integration and increase the scope for livelihood strategies. More stable policy and regulatory processes for regional trade can reduce price instability, whereas export bans increase instability and reduce trust between traders, producers, households and governments. Regional infrastructure also allows households to participate in markets that would otherwise not be accessible and, by doing so, allows for much greater scope of livelihood strategies.

Few studies examine the effects on migration. On the one hand, regional infrastructure promotes migration, as transport improvements help reduce the distance to travel to reach more profitable income-generating opportunities. On the other hand, better transport may provide incentives to stay by improving living conditions in the region of origin. It has been mentioned in some instances that increased mobility owing to better regional infrastructure may increase the spread of communicable diseases, although it could also be part of the solution by reducing the exposure of households to such risks.

1.2.4. Impact of RITF on growth – evidence on the location of economic activity, FDI flows and firm-level productivity

The links between infrastructure and economic growth are multiple and complex. Infrastructure affects production and consumption directly in the short run, but also indirectly in the longer run, through changes in the strategy and investment decisions of economic actors. Although there may be losers from such changes in dynamics, it is usually expected that the overall net effect will be the creation of additional economic opportunities and employment.

Most of the studies on macroeconomic impacts suggest infrastructure does contribute to increases in output, income and employment growth, but also to quality of life. In Africa, it is shown that infrastructure development

has a robust and significant positive impact on growth in the long run. However, the impact in Africa has been more modest than expected compared with in other developing regions, given a lack of progress on the quality of infrastructure services.

This section provides the main conclusions from the literature on three pathways of impact on growth of infrastructure and the reduction in trade and transaction costs: the location of economic activities, FDI flows and firm-level productivity.

Location of economic activity

Regional integration can be an important tool for development by fostering growth and poverty reduction. However, the positive impacts can be hindered by economic divergence, both between and within countries, whereby some parts or countries gain much more in relative terms.

The choice of the location of an economic activity depends on the benefits of dispersion of complementary and similar economic activities compared with the benefits of proximity. The balance between contradictory forces – pushing for more proximity or dispersion of economic actors – affects the creation of agglomeration. Those forces depend on:

- Geographic parameters such as transport costs; the mobility of economic agents; the tradability of inputs or outputs; the importance of the economies of agglomeration, which is the benefit firms obtain by locating near each other; lower transaction costs; knowledge spillovers; and the effects of market size (companies locate where they find customers and the labour, services and infrastructure required); and
- Economic parameters such as the complementarity between economic activities.

The new economic geography literature examines the role of geographical and locational factors in driving regional inequality in the context of trade. Results of the effect of regional integration on convergence or divergence between member countries are unclear and depend on a series of parameters. For instance, a country's initial endowment in immobile factors or non-tradable goods could guide the movement of spatial concentration of economic activities. Hence, trade facilitation can lead to divergence rather than convergence between countries.

Of course, it is still possible to combine convergence in living standards across countries with geographic concentration of economic activities, including through the provision of adequate trade-related infrastructure, both hard and soft. The combination of trade opening and regional infrastructure improvement could therefore be a solution. Resource-rich countries will benefit from the first, whereas infrastructure will connect the resource-poor country to its neighbour. Another way to circumvent the negative divergence effects we highlight above is to enable the geographic mobility of labour. Transport infrastructure can be part of the solution by decreasing the physical cost of migration, both between and within countries. Relying on efficient and affordable transport services, temporary migration could be an answer to the first diverting effect of regional trade integration.

Chapter 2 further explores this issue of geographic dispersion of economic activity as a consequence of better cross-border infrastructure.

Foreign direct investment

Stimulating investment is often a stated objective of regional integration agreements. Regional integration can attract investment, thanks to improvements to the investment environment because of a reduction in NTBs, such as simplification of customs procedures or harmonisation of standards. It is also a signal about the credibility and lock-in of trade reform (shallow versus deep integration). Theory and evidence indicate that the effect of regional integration on FDI depends on the motivation and strategy of the investment. A firm's decision will be a trade-off between production costs, market size and market access. Such motivation can be, for example, taking advantage of lower production costs or a 'tariff-jumping' effect because it can be more efficient to develop a production site in each country in order to avoid high tariffs.

Evidence shows that belonging to a regional integration agreement increases FDI between two member countries. Moreover, it shows the potential loss of FDI related to the disappearance of 'tariff jumping' FDI is normally more than offset by other factors encouraging FDI. However, it also highlights that regional integration is not sufficient

to attract FDI and that only members with an advantageous investment environment take advantage of the effect on FDI promotion (consistent with the new economic geography literature). There is a risk that less attractive investment destinations may lose FDI following regional integration. The relative size of a country's economy within a region matters for attracting additional FDI, as does a central location in relation to the largest market, highlighting that regional infrastructure can be important in transmitting the effects. More specifically, the literature highlights that constraints on hard infrastructure affect FDI in Sub-Saharan African countries negatively and significantly.

Infrastructure and firm-level productivity

A decrease in trade costs facilitated by improvements to regional infrastructure can result in an increase in a firm's productivity through various channels. The first is by decreasing costs associated with the movement of production factors. The literature suggests that, under certain circumstances, better transport infrastructure allows for greater mobility of skilled and unskilled workers. The increase in market scale potential also supports greater investment by the private sector, assisted by economies of scale and agglomeration. Finally, reductions in trade costs increase access to cheaper and better-quality inputs as well as technologies.

The impact of regional infrastructure on firm-level productivity and the spillovers to the rest of the economy (small and large firms) is one of the most important sustained effects. Small firms depend more than larger firms on a reliable trade environment and are disproportionately affected by high trade costs. Being more organised, large firms are better able to circumvent the lack of hard infrastructure by finding private solutions, and to deal with soft constraints.

However, if firms are unprepared, they can also lose out as a result of the reduction in trade costs and the increase in import competition with larger and better-connected firms.

The existing evidence linking trade-related infrastructure to productivity through improved access to lower prices of imported and domestic inputs relates mainly to the agricultural trade literature. For instance, in India, public investment in rural roads had the largest positive impact on agricultural productivity growth. Isolation, calculated as travel time to markets, is proven to have a negative effect on input use and agricultural productivity in various locations in Sub-Saharan Africa.

Chapter 4 further addresses the importance of efficient regional infrastructure and in particular logistics services for firm productivity.

1.2.5. Making RITF work for growth and poverty reduction

The body of evidence shows regional integration and improving trade facilitation and infrastructure provision are very likely to result in poverty reduction through both direct and indirect routes. However, there may be specific negative effects. Obviously, the balance of the effects will depend on the specific contexts but, in the longer run, the other, more positive, channels are expected to more than offset them. However, this points to a need for policies to support potential losers or to maximise benefits for the poorer and most vulnerable.

The main potential risks to the poor created by increased trade from better regional infrastructure is that such initiatives do not spread sufficiently to the poorest and most vulnerable stakeholders or, even worse, will displace their activities without allowing them to seize the new opportunities that regional integration opens up.

Research to date emphasises the importance of the complementarity of various types of infrastructure and policies in ensuring maximisation of the contribution of (regional) hard infrastructure projects in fostering growth and poverty reduction. They are essential to enable the pass-through of lower trade costs to lower prices in the entire economy as well as to facilitate inclusiveness. Such transmission is key in ensuring even the most vulnerable and isolated stakeholders and regions benefit from regional trade integration.

As jobs and activities are created and displaced, and trade facilitation presents new opportunities to workers and producers, complementary measures are needed to allow a supply response. Such complementary policy could, for instance, facilitate migration to enable labour mobility across space and allow both the market to come to the poor and the poor to come to the market.

Evidence about the regional infrastructure dimension of such issues is still scarce, and this report provides new information on the relevant dynamics. It also emphasises the importance of ensuring small producers and poor households can reap the benefits of better RITF.

1.2.6. New approaches and evidence about the link between RITF and growth and poverty reduction

While the pathways of impact of general trade liberalisation, hard infrastructure and trade facilitation infrastructure have been fairly well explored, this is much less the case for the regional dimension. The approach used in this report is to provide evidence on the impact of regional infrastructure and associated trade cost reduction on the behaviour, risks and opportunities of economic actors (households, firms) through direct and indirect routes.

The report identifies two particular dimensions for which more evidence could provide more support to the relevance of addressing infrastructure for trade facilitation at the regional level. The first focuses specifically on the cross-border dimension. The effect of regional integration on convergence or divergence between countries has been relatively well explored, but the results depend on a variety of country-specific parameters, making it difficult to predict the impact *ex-ante*. In particular, it is difficult to disentangle the effect of a particular trade facilitation initiative. This is the focus of the first part of this report: examining the effects of cross-border infrastructure on spatial growth patterns and then exploring the specific effect on economic actors at the border (including the fourth type of economic actor, whose economic activity depends directly on high trade costs).

The second approach is to show how addressing infrastructure for trade facilitation at the regional level can orient and scale up effects identified in the theory of change. To do so, we suggest looking at RITF in the context of new regionalism approaches and value chain analysis. We focus, in particular, on determinants of efficient logistics services as one essential element for firms' productivity, for developing and upgrading value chains and to guarantee the pass-through of the benefits of investments in hard infrastructure throughout the value chain.

This report is organised in three clusters. The first cluster of the report (Chapter 2) provides new evidence about how cross-border infrastructure can support economic activity and livelihoods, thereby reducing poverty. The second cluster of the report (Chapter 3) focuses on infrastructure for the development of, and integration into, local and international value chains. The final cluster of this report (Chapter 4) focuses on how hard and soft infrastructure affect the performance of trade-related logistics services and, thereby, the productivity of firms – which, in turn, affects their competitiveness, economic activity and employment.

Each of these clusters provides evidence of linkages between RITF and elements of the theory of change (summarised in Table 2), drawing on background research papers commissioned for this report and exploring new data.

Table 2: Channel of impact on growth and poverty reduction explored in the report and main findings

Cluster	Channel of impact on growth and poverty reduction
<p><i>Cluster 1</i></p> <p>Impact of cross-border infrastructure on economic activity at the border and along trade corridors</p>	<p>RITF for spatial growth patterns</p> <p>Measure of RITF: Corridors and LPI</p> <p>Channel of impacts: Better RITF affects location of economic activity</p> <p>Links to impacts identified in theory of change (on impact and risks): Job creation/destruction (+/-); Access to public services (+) (health, schools); Short-term, long-term migration and remittances (+/-); Positive and negative spillovers from agglomeration and congestion (Production factor prices: wages (+); Assets and resources prices (house, land, etc.) (+/-); Resource degradation (-); Change in localisation of economic activity, (+) if reduction in spatial inequality, (-) if concentration)</p> <p>Main likely impact: Reduction in spatial inequality</p> <p>Main policies to address risks and increase benefits:</p> <ul style="list-style-type: none"> - Developing secondary road networks, ICT infrastructure and health and education infrastructure - Supporting complementary policies to support access to public services

	<p>RITF for job opportunities and livelihoods of informal cross-border economic actors</p> <p>Measure of RITF: Cross-border infrastructure –OSBPs</p> <p>Channel of impacts: New cross-border infrastructure affects informal activities of households at the border</p> <p>Links to impacts identified in theory of change (on impact and risks): Informal trader (?); Gender issue (+/-); Informal economy (-)</p> <p>Main likely impact: Better conditions for informal traders</p> <p>Policies to prevent the risks and increase benefits:</p> <ul style="list-style-type: none"> - Taking into account the specificity of informal traders in the conceptualisation of cross-border infrastructure
<p><i>Cluster 2</i></p> <p>RITF for participation in value chains and integration in international production networks</p>	<p>RITF for GVC integration</p> <p>Measure of RITF: Five infrastructure and trade facilitation variables</p> <ol style="list-style-type: none"> 1. Infrastructure component of LPI 2. Liner Shipping Connectivity Index produced by UNCTAD 3. World Bank’s Air Connectivity Index 4. Road network density from CIA World Factbook 5. OECD TFIs <p>Links to impacts identified in theory of change (on impact and risks): Creation or expansion (+)/displacement or destruction (-) of economic activities; Cross-border value chain development (+); Lower input prices (+); Increase in productivity (+); Job creation/destruction (+/-)</p> <p>Main likely impact: RITF matters for GVC integration</p> <p>Policies to prevent the risks and increase benefits:</p> <ul style="list-style-type: none"> - Support for a regional approach to infrastructure development - Complementary training to prepare firms for competition and entry into GVCs <p>RITF for smallholder participation in local and regional value chains</p> <p>Measure of RITF: Provision of warehouses, warehouse services and regulation for the maize value chain</p> <p>Links to impacts identified in theory of change (on impact and risks): Increase in consumption/welfare (+); Increase in resilience and food security (+); Smoothing effect of shocks and decrease in price volatility (+)</p> <p>Main likely impact: Integration of smallholders in local and regional value chains</p> <p>Policies to prevent the risks and increase benefits:</p> <ul style="list-style-type: none"> - Complementary regulatory framework to address coordination failure in the value chain
<p><i>Cluster 3</i></p> <p>RITF for the productivity of firms and efficiency of logistics services</p>	<p>RITF for the productivity of firms</p> <p>Measure of RITF: Regional infrastructure indicators using LPI; regional trade</p> <p>Links to impacts identified in theory of change (on impact and risks): Lower input prices (+); Increase in productivity (+); Job creation/destruction (+/-)</p> <p>Main likely impact: RITF and regional exporting associated with higher firm-level productivity</p> <p>Policies to prevent the risks and increase benefits:</p> <ul style="list-style-type: none"> - Support for a regional approach to infrastructure development will have long-lasting effects though exporting and importing - Complementary policies are required to reduce costs of border crossings but also to reduce the dispersion in the costs faced by different firms for the same gateway <p>RITF and the efficiency of logistics services</p> <p>Measure of RITF: Corridors, transit agreements, logistics services</p> <p>Links to impacts identified in theory of change (on impact and risks): Direct impact on sales (depending on firm’s productivity level) Increased sales (+); Decreased sales (-); Creation or expansion (+)/displacement or destruction (-) of economic activities; Cross-border value chain development (+); Job creation/destruction (+/-)</p> <p>Main likely impact: Efficient logistic services are important to ensure that effect is passed through to all economic agents</p> <p>Policies to prevent the risks and increase benefits:</p> <ul style="list-style-type: none"> - Addressing localisation barriers preventing efficient regional logistic services

2. Impact of cross-border infrastructure on economic activity at the border and along trade corridors

This chapter focuses on the impact of cross-border infrastructure on economic activity. It does so in two ways, first using an economic geography approach to identify trends in the concentration of economic activity in relation to upgrades in cross-border infrastructure (Section 2.1); and then describing more specifically actors at the border, with a focus on informal traders and workers (Section 2.2). Section 2.3 draws out policy conclusions.

Box 2 below summarises the main findings set out in this chapter.

Box 2: Key findings on the effects of cross-border infrastructure on formal and informal activity along the border

This chapter examines a core element in the theory of change: how does cross-border infrastructure affect the location and magnitude of formal and informal activity along the border? It also draws out policy implications.

New research for the project finds the facilitation of trade across borders leads to a greater spatial spread of economic activity, suggesting trade facilitation projects are valuable not just for their growth effects but also for their spatial effects and reduction in urban pressures.

There will be different effects in specific contexts. For example, the facilitation of trade has led to less activity at the Chirundu crossing (few reasons to be at the border stop) but more activity in Busia (which is a border city).

Policy can help sustain the reduction in spatial inequalities by fostering new economic activity hubs, for example through complementary investment in rural areas and small urban centres to support closer markets for rural populations and increase access to public services. Specifically, this could include (i) complementing corridor investment with investment in feeder roads and energy infrastructure in rural areas or smaller cities; and (ii) the provision of health and education infrastructure to address the needs of the vulnerable groups in such areas.

The facilitation of trade has a direct impact on informal traders. Estimates suggest informal trade can be as high as formal trade. While informal cross-border traders operate outside the legal framework, in practice they are deeply embedded in the economy, and they provide services and livelihoods to a large number of people.

While efforts to formalise these businesses might not be successful or even desirable in the short run, it is still possible to facilitate their trade, allow them to operate in a safer environment and reduce their vulnerability. This could allow them to scale up and eventually take the formalisation route.

In the specific case of informal traders around the one-stop border post (OSBP) in Busia, new research finds that (i) the effects are mostly beneficial even for the directly affected informal traders/households, but there are some specific negative impacts; (ii) it is important to design temporary community development programmes for those affected in the short or long run; and (iii) corruption remains a problem, and the new OSBP still has issues, but overall the border is now easier to cross (with little sign of harassment).

Several measures can be used to facilitate cross-border trade and ensure a safe environment, while at the same time complying with public health, safety and security requirements. These include (i) creating a specific crossing point for informal traders carrying small cargo; (ii) increasing the monitoring of interactions between authorities and informal traders to address the harassment of informal women traders in particular; (iii) making information on procedures and regulations accessible to informal traders; and (iv) engaging regularly with the associations representing traders.

2.1. Cross-border infrastructure and economic activity along trade corridors

2.1.1. Borders, trade and the location of economic activity: what do we know?

The existing theoretical and empirical literature is ambiguous on the impact of trade liberalisation on inequality and the location of economic activity (see Brühlhart, 2011, for a comprehensive discussion). Some argue that as a country opens up to trade (or opens up more to trade), inequality between regions is likely to rise (World Bank, 2009), and agglomeration may be reinforced (Monfort and Nicolini, 2000; Monfort and van Ypersele, 2003). Other studies predict just the opposite, suggesting instead that openness to trade has a role to play in the *reduction* of spatial inequalities (Ades and Glaeser, 1995; Krugman and Livas Elizondo, 1996).

Krugman and Livas Elizondo (1996) contend that the location of economic activity results from the interplay of two forces: transport costs and economies of scale (see Thisse, 2009 for a review of the issues). High transport costs encourage producers to locate close to markets. In contrast, economies of scale do not determine where production locates initially; rather, they induce its agglomeration wherever it happens to be. Firms locate where markets are (what Krugman and Livas Elizondo somewhat counter-intuitively called ‘backward linkages’), whereas spatially mobile consumers migrate to production centres, contributing to deeper markets there (‘forward linkages’). These forces create a positive feedback loop leading to the agglomeration of activity and population in large production (urban) centres. In a closed country, the only counterforce is congestion, for example in the form of rising land prices, leading to a core–periphery spatial equilibrium generally characterised by over-congestion.⁶ In contrast, as a country opens up forward and backward linkages lose relative importance for both export-oriented firms and those importing their intermediates from abroad. For these firms, congestion factors become relatively more important, creating an incentive to locate away from traditional production centres. This phenomenon was observed in Mexico when trade liberalisation in the 1990s led to a dramatic shift of production away from Mexico City towards northern provinces close to the US market.

2.1.2. Agglomeration and trade in Sub-Saharan Africa: what the lights say

The issue of spatial inequality and agglomeration is particularly important in Sub-Saharan Africa. Net rural–urban migration typically accompanies economic growth until a country is predominantly urban (Tacoli et al., 2015), but many governments have historically found it difficult to build the scale of sanitary and transportation infrastructure that urban growth requires. Living conditions have deteriorated steadily in most of Africa’s cities over the post-World War II period, in spite of higher-than-average incomes.⁷ Also, migrants are subject to higher levels of vulnerabilities and additional challenges in accessing social protection, compared with both permanent urban residents but also other vulnerable groups (Sabates-Wheeler and Waite, 2003). The UN Human Settlements Programme (UN-Habitat) (2003) estimates that over two-thirds of Sub-Saharan Africa’s urban population live in slums, and Montgomery et al. (2003) report that urban children are more exposed to diseases than rural ones after controlling for household income.

If the Krugman–Livas hypothesis holds for Africa, trade openness can potentially contribute to alleviating Africa’s urban problem by leaving governments and donors more time to build adequate infrastructure. Alternatively, if

⁶ In the model of Behrens et al. (2007), another counterforce against agglomeration is the presence of immobile farmer populations, a factor that is undoubtedly important in most of Sub-Saharan Africa’s countries, where over half of the population is still employed in agriculture.

⁷ For instance, in the early 2000s, Addis Ababa accounted for 4% of Ethiopia’s population but a fifth of its GDP.

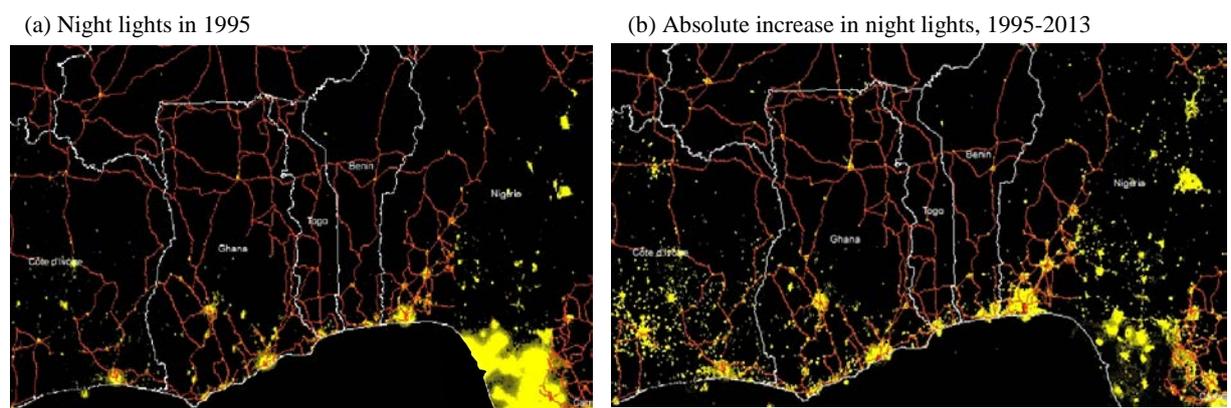
more trade leads to more concentration, projects and policy advice leading to reduced trade barriers and hence more trade should be complemented by compensatory measures aimed at mitigating its negative spatial effects, including wider inter-regional inequality and urban crowding, both of which could turn into factors of political instability.

This section draws on the first background paper supporting the project (Cadot et al., 2015), which explores the Krugman–Livas hypothesis in the Sub-Saharan African context. The paper uses night lights captured by satellites to measure the location of activity and trade facilitation indicators to measure openness to trade.

Beyond the issue’s immediate policy relevance for development partners, Sub-Saharan Africa is an interesting region to use to explore the effect of expanding trade on the location of economic activity. First, the continent has only recently embarked on a process of structural transformation away from agriculture, with urban migration ongoing (Kessides, 2006). Second, it has undergone substantial trade liberalisation in the years over which night light data have been available. Night lights, captured by satellites, provide a good signal of the density of economic activity in very finely disaggregated geographical areas (Box 3). While trade liberalisation in the rest of the world has progressed, intra-African liberalisation has remained limited, as high transport costs and numerous NTBs still hamper the free movement of goods and people across the continent’s inland borders. Thus, while trade liberalisation progressed more in other regions before night light data became available, it is still an ongoing process in Sub-Saharan Africa. Finally, it is important to understand the effects of trade facilitation projects on spatial growth patterns if the objective is to maximise their impact on inclusive and sustainable development.

Figure 3 examines night light data along the Abidjan–Lagos corridor. The stylised facts suggested by such a simple inspection of light patterns seem in line with what can be expected from the models. It shows the initial level (panel a) and absolute increase (panel b) in night light emissions along the Abidjan–Lagos coastal corridor in West Africa over the period from 1995 to 2013. Some of the increase is clearly driven by idiosyncratic events like the political crisis and stabilisation in Côte d’Ivoire, where panel (b) shows a large and widespread increase in light. Agglomeration along the coastal corridor, in line with the models of Brühlhart et al. (2004) and Crozet and Koenig (2004), is also clearly visible in panel (b). Thus, the effect of agglomeration near ports (where access to overseas markets is easiest) seems, *a priori*, to dominate the ‘natural protection’ argument in this particular case. This is to be expected given that the region is home to very little manufacturing (Macmillan and Hartgren, 2014; MacMillan and Rodrik, 2011; Rodrik 2014). Interestingly, there seems also to be some spatial convergence, as there is relatively little light increase relative to the initial level in the Lagos metropolitan area (to the south-east of the picture), suggesting the force of congestion is at play.

Figure 3: Coastal agglomeration and congestion along the Abidjan–Lagos corridor



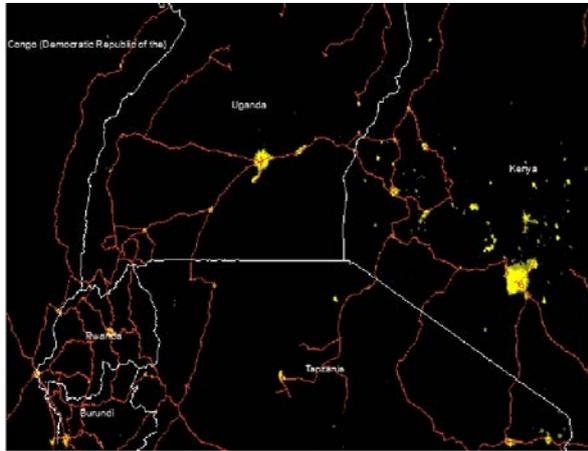
Note: Major highways are shown in red, national borders in white and night lights in different shades of yellow depending on their intensity (panel a) or the intensity of their increase (panel b). Source: ArcGIS software.

Figure 4 shows the Nairobi–Kampala–Kigali segment of the Mombasa–Kigali corridor, which, unlike the Abidjan–Lagos one, moves away from the seaside. As in West Africa, the picture reveals an unmistakable pattern of recovery from political violence after Rwanda’s genocide, as the whole country was ‘black’ in 1995. Growth

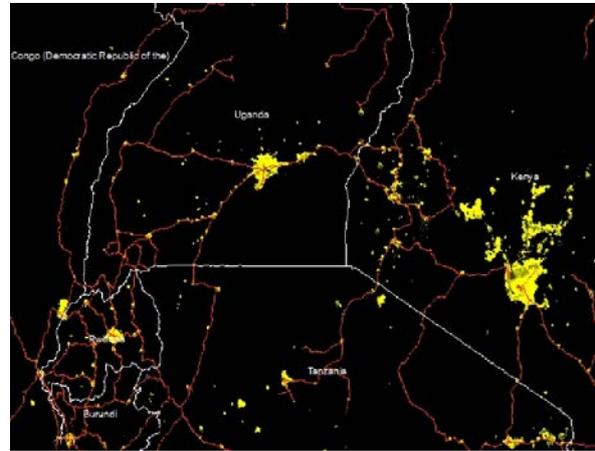
is also concentrated along the Kampala–Jinja–Malaba–Kisumu corridor leading to Nairobi, with areas to the north remaining largely black (the region at the centre of the picture is Lake Victoria).⁸

Figure 4: Agglomeration along the Nairobi–Kampala–Kigali corridor

(a) Night lights in 1995

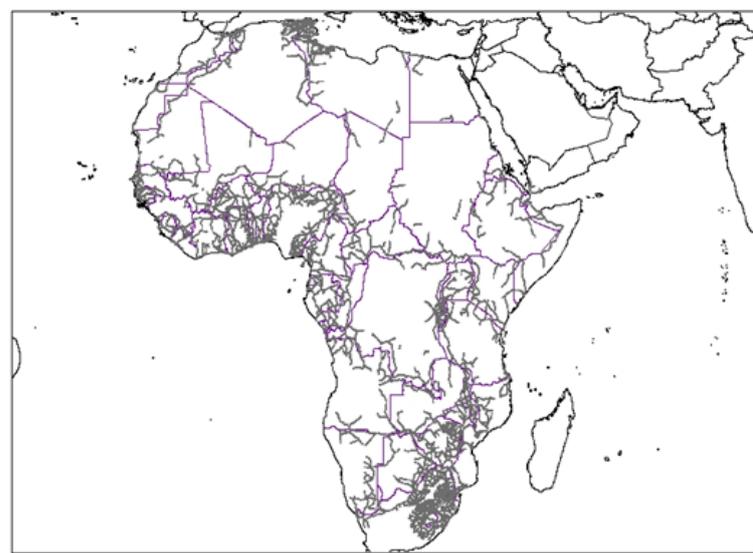


(b) Absolute increase in night lights, 1995-2013



Note: Major highways are shown in red, national borders in white and night lights in different shades of yellow depending on their intensity (panel a) or the intensity of their increase (panel b). Light intensity not corrected for glow (see Box 3). Source: ArcGIS software.

Box 3: Measuring economic activity by night lights



on Sub-Saharan African countries (Sudanese borders excluded) excluding South Africa, we obtain around 9,000 cells for our analysis. The figure shows the road network obtained this way.

For each of the resulting cells, we compute the distance of its centre to the closest border. In addition, roads are classified by their importance: highway, major road and local road in decreasing order. National road names are used to identify individual roads. Using the Gridded Population of the World,⁹ we also compute the average

We match geo-referenced night light data with highway data and national border data for Sub-Saharan Africa into a single digitalised dataset amenable to analysis using GIS software. As a first step, we construct buffers with a width of 5 km around all border crossing roads, using the Natural Earth dataset. On these buffers, we impose a grid with a maximum cell size of 10 km x 10 km (cell size varies because roads and borders do not run in perfectly straight lines. Focusing only

⁸ Northern Uganda was also home to endemic political violence until the Lord's Resistance Army of Joseph Kony, a highly violent group, was tamed (albeit never completely eliminated) around 2013.

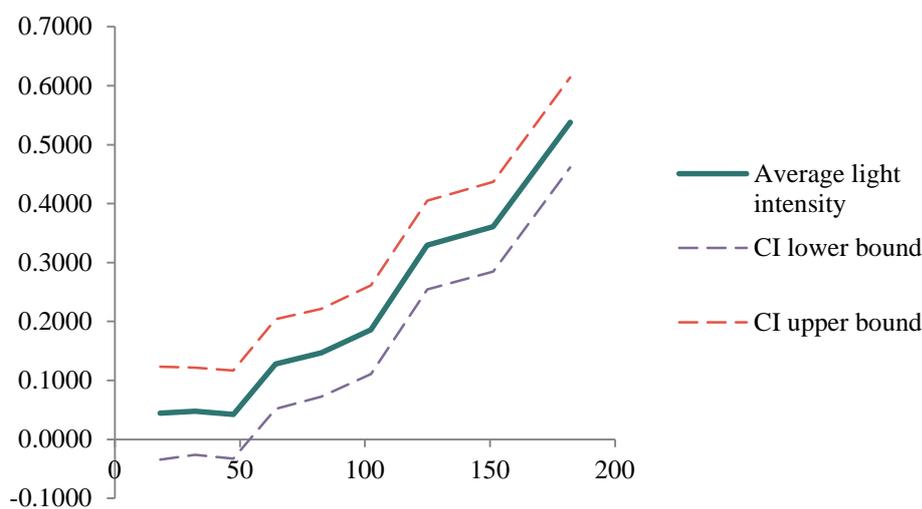
⁹ <http://www.ciesin.columbia.edu/data/gpw-v4/>

population density per square kilometre for each road piece in each year. Finally, we also match our blocks with geo-referenced altitude data.

We further correct light data for overglow. Weaknesses in the optics of DMSP satellites (scanning elliptical areas on the Earth's surface but ascribing observed light to significantly smaller square pixels) lead to the misattribution of light from emitting locations to neighbouring, non-emitting, areas. As our analysis focuses on distinguishing border effects in very narrow corridors, overglowing poses a problem, potentially undermining the identification of our hypothesis of a sharp increase of light intensity at borders. While waiting for a more precise correction mechanism to be made available, we follow the spatial econometrics approach of Pinkovskiy (2013), who finds lights in neighbouring cells to be correlated with an autoregressive coefficient of -0.23. After correcting for overglow, we compute the average light intensity within each cell for 1995, 2000, 2007 and 2013, years in which satellite light measurements are available.

In spite of substantial improvements, owing, in part, to the efforts of development partners, Africa's intra-continental borders are still relatively trade-unfriendly, being plagued with, among other things, long clearance times, congestion resulting from poor infrastructure, redundant paperwork and lack of automation. One would thus expect to observe an Iron Curtain effect, whereby activity, as measured by night lights, decreases along the continent's main cross-border corridors as one gets closer to borders.¹⁰ This is indeed visible in Figure 5, which shows average light emissions as a function of distance to the border. The curve in Figure 5 is constructed by regressing night light emissions on 10 binary variables taking the value of 0 or 1 (dummy variable), marking deciles of the distance to the border over a 200 km range around borders along the continent's main cross-border highways. The regression controls for altitude (as economic activity is typically stronger in plains), population density and country and year fixed effects. The black curve shows the point estimates and the red dotted curves mark the limits of the 95% confidence interval. The decrease in night light as one gets closer to the border is quite visible.

Figure 5: Light intensity along cross-border corridors increases with distance from borders



Note: The horizontal axis measures distance from the border in km, within a 200 km buffer around Africa's cross-border highways. The vertical axis measures the point estimate of the coefficient on dummy variables, one for each of those deciles (the first omitted because of co-linearity), in a regression where the dependent variable is light intensity in 'bins' of variable size, controlling for altitude, population density and year and country fixed effects. The 'counterfactual' for each coefficient

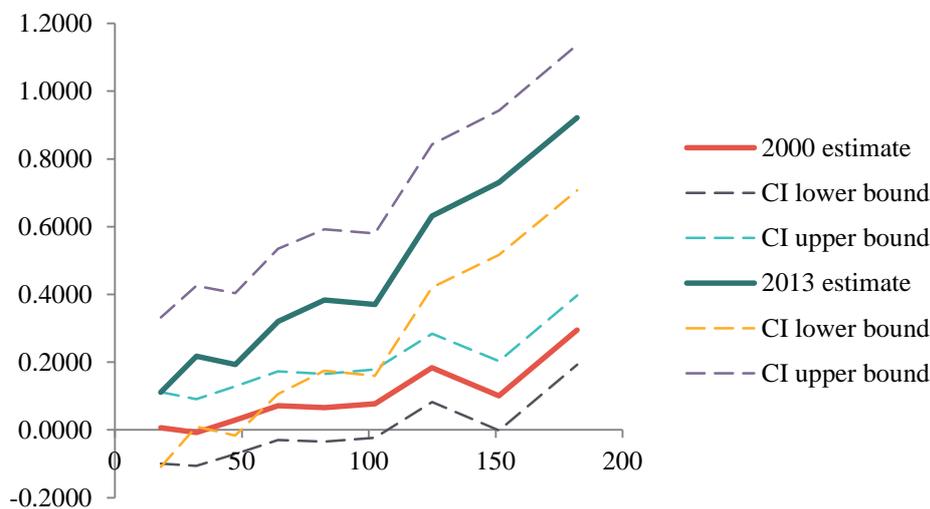
¹⁰ It is also important to note that borders are often deliberately placed in areas of relatively low habitation, for example along rivers, in mountainous areas or other areas that are generally difficult to pass.

is average light intensity in all other deciles; thus, zero on the vertical axis does not mean zero light. Only the relative position of deciles along the curve matters.

Source: Authors' calculations using ArcGIS software.

Moreover, Figure 6 shows this pattern has reinforced itself over time. Figure 6 decomposes the curve in figure 5 by year, with one curve for 2000 (with the pink confidence interval) and one for 2013 (with the blue confidence interval). The latter is substantially steeper, showing activity has agglomerated away from borders, toward national production centres – a pattern opposite to that observed in Mexico in the 1950s and 1970s, where *maquiladoras* were all located along the northern border, but more in line with contemporary patterns in Mexico.¹¹ While one may not expect Ugandan firms to locate close to the border with Rwanda given the small size of Rwanda's market,¹² they could be expected to locate more towards the Kenyan border, as Kenya is Uganda's larger partner in the EAC and in COMESA. In practice, they do not. Instead, they agglomerate towards the middle of the country, as the Krugman–Livas hypothesis predicts for relatively closed economies. This is a puzzle, since Uganda has pursued open trade policies for several decades, suggesting possibly that, if the Krugman–Livas hypothesis is true, other factors besides trade policy – landlockedness, poor infrastructure and logistics – have contributed to preventing Uganda from opening up fully.

Figure 6: Light intensity along cross-border corridors and distance to border: activity agglomerates away from borders



Note: The horizontal axis measures distance from the border in km. See the note below Figure 5 for details of the curves' construction.

Source: Authors' calculations using ArcGIS software.

As already noted, given the inability of Sub-Saharan African governments to put in place the governance structure and resources needed to accompany the growth of cities, the agglomeration trend visible in Figure 6 could be a source of concern. As noted by Kessides (2006: 8), 'the real surge in Africa's urbanization is yet to come'. Against a background of extremely dynamic demographics (the population of many East African countries is growing at over 3% per year), uncontrolled city growth without proportional improvements in infrastructure and job opportunities could turn into a powerful factor of political destabilisation. Questions arise as to whether initiatives to facilitate intra-African trade foster spatial dispersion, as the literature suggests for other countries, or spatial concentration?

¹¹ Contemporary patterns of night lights in Mexico reveal a general concentration of light around Mexico City, and generally dark areas along the border and in the northern part of the country (punctuated by a few spots of light on the border and in isolated areas in the north) (see <http://darksitefinder.com/maps/world.html>).

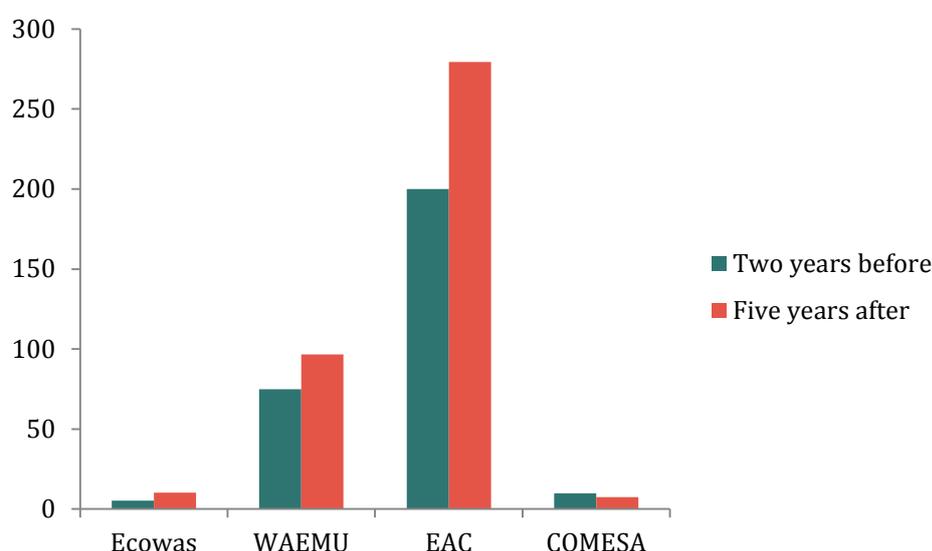
¹² However, eastern Democratic Republic of Congo (DRC) is a large market for many Ugandan companies, so agglomeration towards the eastern border would not be impossible either.

2.1.3. Has trade facilitation reduced spatial inequalities?

It is a well-known observation that Africa's borders are 'thick', although how thick remains a matter of debate. Quantity-based evidence suggests intra-African trade is well below benchmarks predicted by the usual trade models (see de Melo and Tsikata, 2014, for a review), but estimates are plagued by the lack of reliability of trade statistics for overland trade. Price-based evidence (Aker et al., 2014; Brunelin and Portugal-Perez, 2013) yields variable estimates of border effects, generally substantial although not prohibitive. Interestingly, Aker et al. find larger effects around ethnic borders than around national ones.

Has African regionalism led to the dispersion of economic activity? One should not expect too much. While the continent's many RTAs all aim at reducing trade barriers, implementation on the ground has been uneven. Figure 7 compares trade intensity indices, a conventional measure of a bloc's relative importance in the overall trade of its members, before and after implementation dates. In most cases, the rise is modest, with no rise at all in the case of COMESA.¹³ There is much anecdotal evidence suggesting the presence of NTBs, including the non-recognition of certificates of origin, denying the benefits of regional liberalisation schemes.

Figure 7: Regional trade intensity indices show little rise around free trade area implementation dates

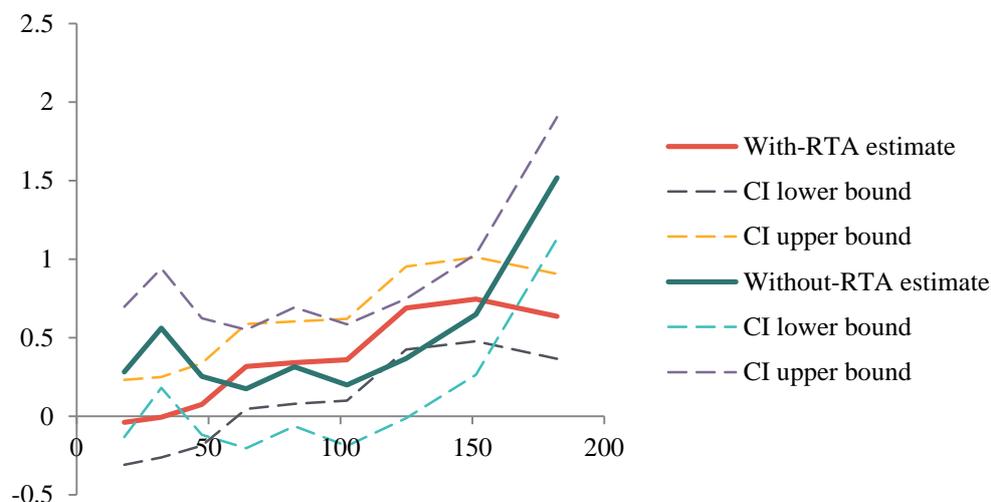


Notes: Time periods 1991-1992 and 1997-9898 for ECOWAS and COMESA, 1992-1993 and 1998-1999 for WAEMU, 1997-1998 and 2003-2004 for EAC. WAEMU members are excluded from ECOWAS. The trade intensity index is calculated here as the ratio of the bloc's share in members' exports to its share in non-members' exports ($T_{ij} = (x_{ij}/X_{it})/(x_{wj}/X_{wt})$). Source: Adapted from Table 2, de Melo and Tsikata (2014).

Against this background, figure 8 reproduces figure 6 but, instead of splitting the sample by year, it splits it between within-RTA borders and borders between countries not belonging to the same RTA. Consistent with the anecdotal evidence, African regionalism does not seem to have much effect on spatial patterns of development, as the effect of distance on light along cross-border corridors does not change in any clear-cut way between intra-RTA borders (red band) and non-RTA borders (blue one), except in the most distant decile, where activity in RTA members is located closer to the borders compared with activity in non-RTA members.

¹³ In considering these comparisons, it is important to bear in mind the differences in the relative sizes of the markets that comprise the various RTAs on the continent. For example, the total population across all COMESA countries (more than 400 million) is nearly three times the size of the total population of the EAC internal market (approximately 143 million).

Figure 8: Regionalism does not seem to have tamed the force of agglomeration



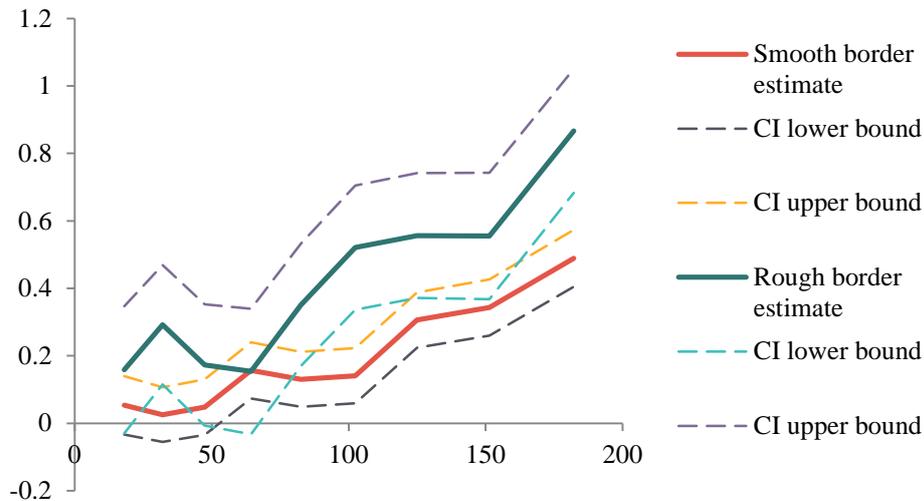
Note: The horizontal axis measures distance from the border in km. See the note below Figure 5 for details of the curves' construction.

Source: Authors' calculations using ArcGIS software.

However, the reduction in trade costs across Sub-Saharan Africa's inland border has not been limited to tariff reduction. Trade facilitation has involved a much broader agenda, covering customs automation through the adoption and regular upgrading of the Automated System for Customs Data (ASYCUDA), the use of post-control audits and risk management and the adoption of international standards including, among others, the WTO's Agreement on Customs Value, the revised Kyoto Convention on the Simplification and Harmonisation of Customs Procedures and the revised Arusha Declaration on Customs Integrity (Zake, 2011). In a few cases, OSBPs have been established, as in Malaba, at the border between Kenya and Uganda (in 2006) and Chirundu, at the border between Zambia and Zimbabwe (in 2009). OSBPs allow trucks to be checked only once each way, with crossing times reduced by factors of four or five, from over a day to a few hours (see below). Time delays have been shown to restrict trade like tariffs and NTBs (Freund and Rocha, 2011), while reductions in clearance and crossing times have substantial effects on the ability of firms to export and grow, as Volpe et al. (2015) show in a Latin American context.

The reduction in time barriers to trade that trade facilitation efforts have achieved can thus be seen as trade liberalisation measures, and can be expected to have similar effects on spatial patterns of activity. This is what Figure 9 shows, by splitting cross-border corridors according to their 'trade friendliness'. Corridors are classified as 'smooth' when the product of the two bordering countries' 'efficiency of customs clearance' score on the World Bank's LPI is above the median, and 'rough' when they are below. The Iron Curtain effect is clearly dampened in the case of smooth borders, as the two curves are significantly different from one another starting at decile six, with the one for 'rough' borders much steeper.

Figure 9: Light intensity along cross-border corridors and distance to border – logistics-friendliness matters

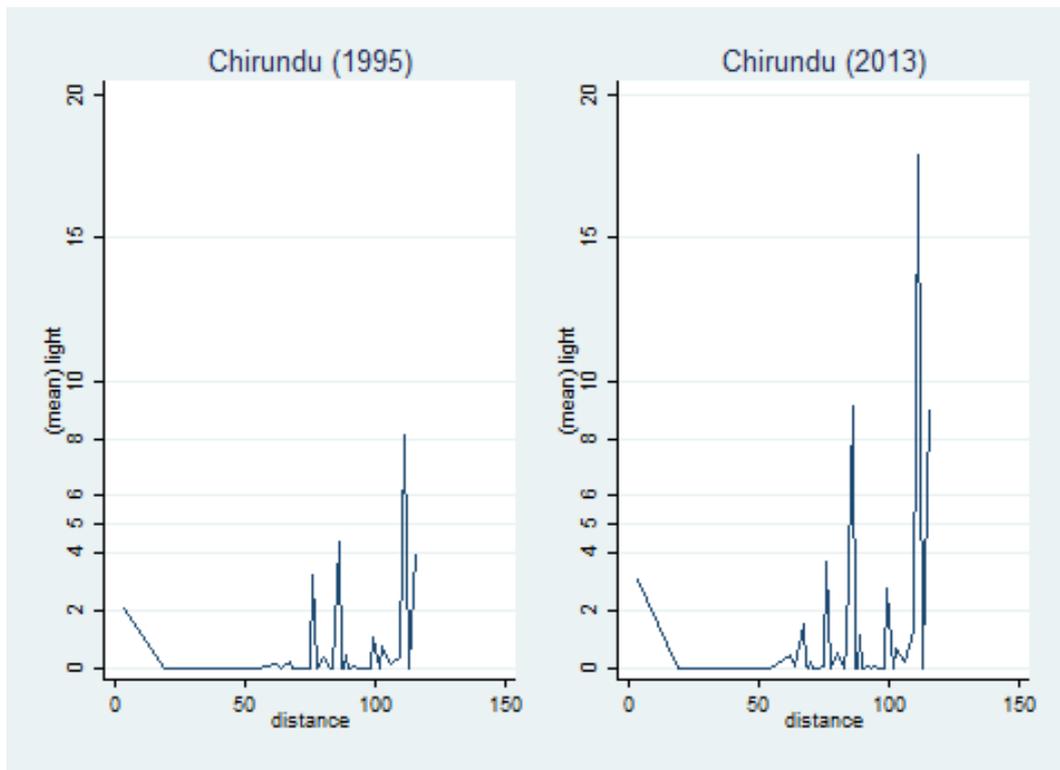


*Note: See the note below Figure 5 for details of the curves' construction.
Source: Authors' calculations using ArcGIS software.*

These results have been tested against a variety of econometric techniques and the Iron Curtain effect is significant in all specifications, with light intensity increasing with distance from the border. The ease of clearance processes as measured by the product of the LPI clearance efficiency score of the two countries sharing the border also correlates positively with overall light levels along corridors. Most importantly, smoother borders (higher LPI clearance efficiency scores around the border) dampen the effect of distance. Thus, by and large, our results go in the direction of the Krugman–Livias effect – namely, a reduction in spatial concentration as trade is liberalised. This is an important result for development partners, as it suggests trade facilitation projects are valuable not just for their growth effects but also for their induced spatial effects.

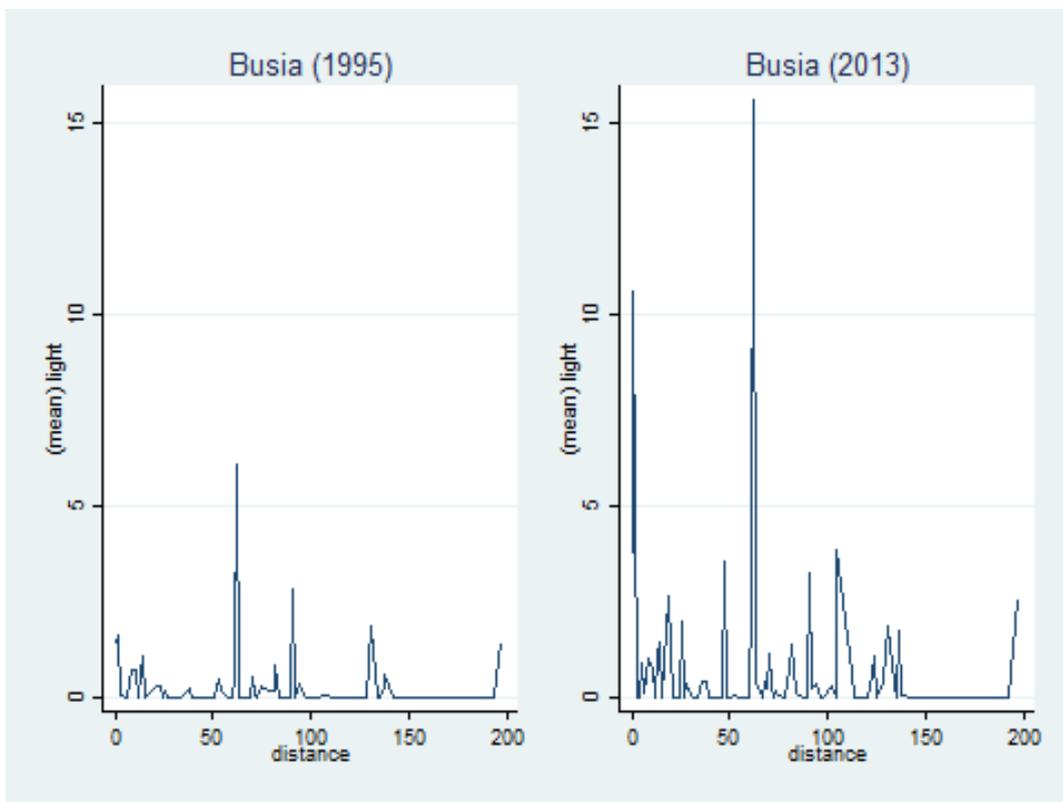
These effect, however, are 'global' ones. Locally, trade barriers and slow clearance times give rise to a host of formal and informal service activities directed at truckers (food, accommodation and other) as well as smuggling-related activities that require physical presence at the border. By cutting clearance times, facilitation reforms can affect the rationale for locating such services and activities around border posts. These effects can be substantial. In Malaba, where over 600 trucks cross every day from Kenya to Uganda, average crossing times were cut from 24 hours on average before the OSBP's implementation to four hours after, with a maximum of six. At Katuna, at the border between Uganda and Rwanda, crossing times after modernisation were reduced to three hours. At Chirundu, where traffic averages over 250 trucks per day, the OSBP has substantially reduced congestion and dwell times as well (Ben Barka, 2012). Thus, truckers spend less time at the border, cutting their demand for local services, and one might expect to observe a reduction in the local light peak at the border after facilitation reforms. In Chirundu, Figure 10, which shows light peaks along the highway around the border as function of distance (an average of both sides), suggests that, while light emissions have increased along the highway, they have increased much less at the border peak. However, it is the case neither for Busia, a border town (see Figure 11), nor for Malaba (Figure 12), and regressions of the border light peak on trade facilitation variables similarly yield ambiguous or non-significant results.

Figure 10: At Chirundu, the OSBP has reduced activity immediately around the border



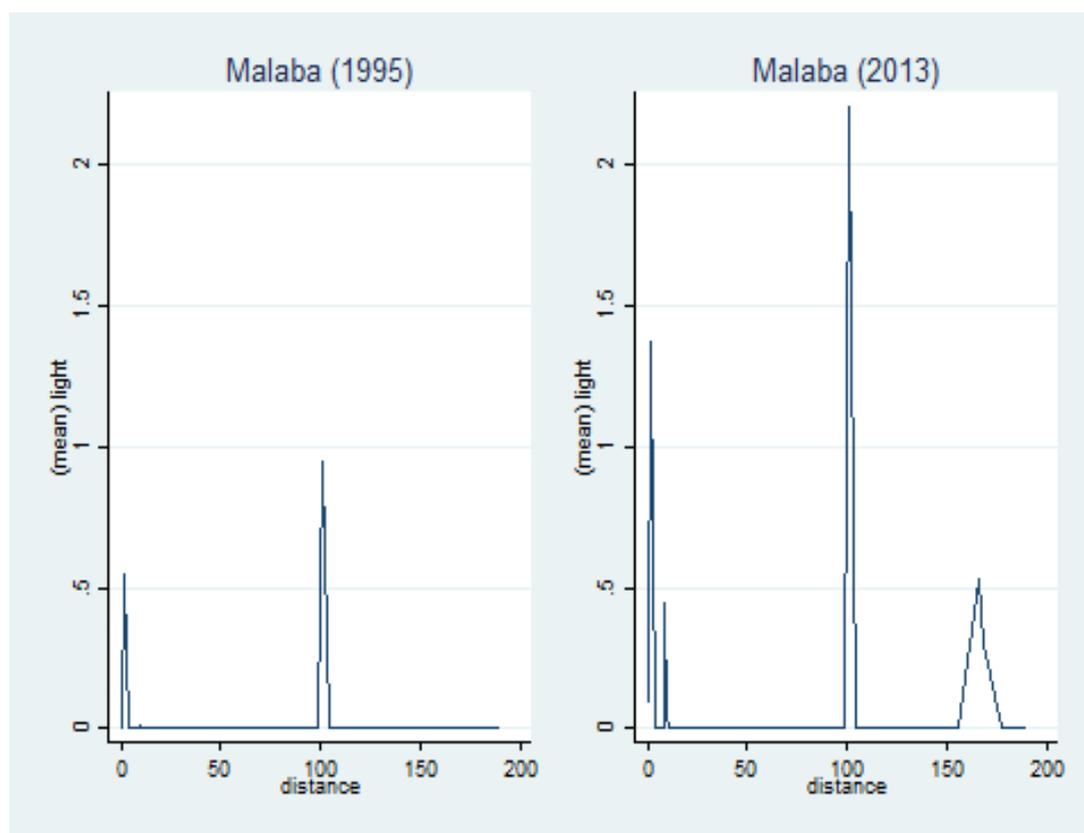
Source: Authors' calculations using ArcGIS software.

Figure 11: Light peaks around Busia before and after modernisation



Source: Authors' calculations using ArcGIS software.

Figure 12: Light peaks around Malaba before and after modernisation



Source: Authors' calculations using ArcGIS software.

Thus, one cannot conclude in general whether activities linked to informal trade, smuggling and trade-related services are systematically affected by trade facilitation initiatives. More research is needed on this particular issue, which is of potential importance for the populations involved – often vulnerable ones (ethnic groups straddling borders and women in particular). We describe this further research in Section 2.2

2.1.4. Conclusion

The research using night lights provides new evidence about the positive effect of cross-border infrastructure and facilitated trade on the reduction of spatial inequalities in Africa, suggesting trade facilitation projects are valuable not just for their growth effects but also for their induced spatial effects (i.e. more dispersion of activity closer to borders). While trends of economic concentration around urban centres are a natural process along with economic transformation, spreading the burden of rural–urban migration could decrease tensions and allow governments to more efficiently address the infrastructure gap in rapidly growing major capital cities as well as to decrease the vulnerability of internal migrants.

In an analysis overlapping a spatial analysis of in-country migration and poverty in Gauteng, South Africa, Cross et al. (2005) highlight that attraction of in-migration is towards 'localities on the borders of existing urban areas that offer income opportunities and a services grid, but which are still relatively thinly settled and not strongly defended by formal urban interests'. Moreover, they emphasise that areas of this kind are particularly important when in-migration takes place under poverty conditions.

The findings in this section support the idea developed in the literature that policymakers should consider not only that infrastructure development is a way to reduce travel costs to existing markets and institutions but also that better transport infrastructure can improve access to markets by inducing the relocation of markets and institutions (Mu and van de Walle, 2009; see Jouanjean, 2013, for a literature review). Facilitating trade in remote regions requires innovative approaches to infrastructure and services development, to promote densification (consolidation) and support sustainable trade links (see examples in the following sections).

2.2. Cross-border infrastructure and informal traders and workers

The previous section covered the effect of cross-border infrastructure on the location of economic activity in general. The following section looks more specifically at what happens to various economic agents whose economic activity depends directly on the efficiency of cross-border infrastructure. According to Brenton and Isik (2012: xvii), intra-Africa fragmentation is bad not just for efficiency but also for equity, as ‘the incidence of barriers to regional trade fall most heavily, and disproportionately, on the poor and on women, and is preventing them from earning a living in activities where they have a comparative advantage – catering for smaller, local markets across the border’. This section is based on a literature review of various case studies identifying the challenges and potential of cross-border trade, as well as on the results of original surveys conducted in Busia, at the border between Kenya and Uganda, investigating the impact of the new OSBP on informal traders and workers (Saana Consulting, 2015a; Tyson, 2015).

2.2.1. Definition and characteristics of informal cross-border trade

Informal cross-border trade can be defined as ‘trade in *legitimately* produced goods and services, which escapes the regulatory framework set by the government, as such avoiding certain tax and regulatory burdens’ (Lesser and Moise-Leeman, 2009). This definition implies both formal and informal firms can participate in informal cross-border trade, with the transaction being unrecorded in official records, and fully or partly avoid payment of duties and charges (ibid.).¹⁴ This includes goods that are traded on unofficial routes, as well as goods that are traded through official routes but involve illegal practices (ibid.).

The nature of cross-border informal trade

By definition, informal trade is unrecorded, and it is thereby difficult to estimate its importance and characteristics. Lesser and Moise-Leeman (2009) conducted a survey to estimate the importance of Sub-Saharan African informal cross-border trade. This comments on the difficulty of measuring informal trade, including the lack of consistent measurement tools and reliable estimates and the dominance of single time period surveys of specific borders and an absence of systematic and time series data collection. Other issues include the focus on land crossings compared with air or sea crossings, differing definitions of informal cross-border trade and diverse monitoring methodologies, which lead to data discrepancies and difficulties in comparing and aggregating data (ibid.).

Lesser and Moise-Leeman (2009) note that, while it is difficult to obtain an accurate overview of the extent of informal cross-border trade in Sub-Saharan Africa, surveys suggest such trade still represents a significant proportion of regional cross-border trade. For example, they report that, in Benin, informal trade amounts to over 90% of actual traded flows (ibid.). Analysing informal trade between Tunisia and its neighbouring countries, Ayadi et al. (2013) find that, while estimations may not be reliable, informal trade flows seem to be much greater than formal trade flows.

Some countries, such as Uganda, estimate informal trade. Uganda regularly conducts informal cross-border trade surveys (e.g. BoU and UBOS, 2011). For example, in 2012, informal exports amounted to \$454 million, or 16% of total exports (\$2,812 million of formal and informal exports in total; UBOS, 2013). For the same year, Uganda informally imported goods with a total value of \$53 million, which accounted for less than 1% of total imports (ibid.). The informal trade figures collected through these surveys are included in the national statistics for the purposes of completeness. However, this is not a common practice in other countries, and a great deal of informal trade goes undetected.

Informal cross-border trade is conducted mainly by individual traders and service providers. While men dominate informal trade between Algeria, Libya and Tunisia (Ayadi et al., 2013), in Sub-Saharan Africa women and MSMEs conduct a large proportion of informal trade (Brenton and Isik, 2012; Brenton et al., 2013; Lesser and Moise-Leeman 2009; Masinjila, 2009).

According to Brenton et al. (2013), women are at the centre of cross-border trade in Sub-Saharan Africa, not only for tradable goods but also for education, health and legal services. However, the difficulties they face push them

¹⁴ Goods that are traded informally tend to be those that are more regulated and/or more taxed.

towards the informal economy, undermining their trade capacity. Moreover, whereas the majority of traders are women, most of the officials who regulate the border are men.

In terms of products, informal cross-border trade involves a variety of products, depending on the economies of the countries involved. Ayadi et al. (2013) find consumer goods such as petroleum products, cigarettes, food products, textiles, alcoholic beverages and electronic goods are most likely to be exchanged informally between Tunisia and its neighbouring countries.

In a study on informal trade between India and Pakistan, Ahmed et al. (2014) find the most commonly traded products are garments and textiles, tobacco items, automobile parts, spices and herbs, pharmaceutical products, cosmetics, jewellery and accessories.

According to Lesser and Moise-Leeman (2009), in East Africa the goods most commonly exchanged through informal cross-border trade are staple food commodities (e.g. maize, rice and cattle) and low-quality consumer goods (e.g. clothes, shoes and electronic appliances). In the Great Lakes region, Brenton and Isik (2012) find trade mostly involves agricultural products. Informal food staples trade is particularly important and plays a key role in food security, making it possible to bring food products from areas in surplus where they are relatively cheap to areas where they are in short supply.

Informal traders are not necessarily the 'poorest of the poor' because of the earning and employment opportunities informal trading and services provide. For example, 20% of the Kenya-Uganda traders interviewed for Masinjila (2009) had other sources of income and access to finance. The paper comments that, 'most were emphatic that they were not poor because one needed money to engage in trade or at least a certain level of creditworthiness that could be verified by the lender' (p.14). The Eastern African Sub-Regional Support Initiative for the Advancement of Women (EASSI) (2012) also confirms the need to self-finance informal cross-border trade and services, which excludes some very poor people. Similar findings arise from a World Bank study of informal trade in the Great Lakes region (Brenton et al., 2013). This examines a number of indicators of the welfare of traders' households and concludes that 'the households of cross-border traders are just as well off as the average urban household that is used as a comparator' (p.6). Tyson (2015) reports that the informal traders interviewed had an average daily gross income of KES 1,700 (around \$17) and no outstanding debt.

Informal traders can nonetheless be considered a vulnerable group. Traders live in a precarious situation and face considerable challenges (Saana Consulting, 2015b). The World Bank reports a survey of trade in the Great Lakes region in which over 50% of respondents reported physical harassment and abuse, including 'beatings, verbal insults, stripping, sexual harassment, and even rape' (Brenton et al., 2013: 7). The same study notes that 80% of respondents reported having to pay a bribe to cross the border. This vulnerability is exacerbated because informal cross-border trade is often illegal in whole or part (Masinjila, 2009; Saana Consulting, 2015b).

Constraints to cross-border trade and informal trade flows

A number of factors explain the presence of informal trade. These are:

- Avoiding trade-related regulations and duties (Afrika and Ajumbo, 2012; Lesser and Moise-Leeman, 2009). Masinjila (2009) finds traders between Burundi and Rwanda exploit price differences across borders. Lesser and Moise-Leeman (2009) report that informal trade is thriving in Côte d'Ivoire, where cocoa exports were taxed by a marketing board. Ayadi et al. (2013) contend that, in Tunisia, informal trade with Algeria and Libya is fuelled by the presence of major subsidies in Algeria or Libya (petroleum products and food products) as well as substantial import tariffs into Libya (textiles, electronic goods).
- Getting around entry or exit barriers of certain commodities, caused by import quotas or export bans (e.g. on some food commodities) or foreign exchange controls (Lesser and Moise-Leeman, 2009).
- Avoiding complex, non-transparent or divergent regulatory requirements (e.g. customs formalities, technical regulations and sanitary standards) that either add to costs or are inoperable by informal traders (Lesser and Moise-Leeman, 2009). For this reason, in some cases traders prefer to avoid formal routes and use illegal routes instead. However, some small traders choose to use formal routes, and in this case they face a number of challenges. Afrika and Ajumbo (2012) cite frequent inspections at roadblocks delaying traders and adding costs to an already costly transport system.

Many of the female informal cross-border traders interviewed by EASSI were stopped at least once for checks before reaching their markets (EASSI, 2012).

Weak law enforcement at the border produces a vicious circle as it facilitates the conduct of informal trade and, at the same time, generates arbitrary applications of trade laws and regulations and requirements for unofficial facilitation payments (bribes) (Lesser and Moise-Leeman, 2009).

Informal traders face several challenges in Africa. Recent studies (Brenton and Isik, 2012; Saana Consulting, 2015a, 2015b; Tyson, 2015) have conducted surveys at some key borders within the EAC and highlight a spectrum of issues that can be broadly defined under three categories:

1) *Poor infrastructure and use of unofficial routes*

When crossing the border, some traders do not pass through the official routes. Rather, they prefer to cross through unofficial routes, which are dirt tracks (Tyson, 2015), also called *panya* routes in East Africa (Saana, 2015b). These routes can simply be more convenient for informal traders, but may also be used to avoid official controls and to smuggle legal or illegal goods (Tyson, 2015). People using *panya* routes incur the risk of being caught, fined, punished or even harassed by the police.

Those who cross through official routes usually have to pass through the crowded route reserved for both formal and informal traders. This leads to congestion and long waiting times. Saana Consulting (2015a) finds women traders with small consignments of perishable goods trying to cross the border between Uganda and Kenya at Busia sometimes have to wait behind large trucks for up to four or five hours. In some cases, these women resort to paying brokers to get their goods across the border in a timely manner (ibid.). Brenton and Isik (2012) report that, at the Goma–Gisenyi border between Rwanda and the Democratic Republic of Congo (DRC), there are two paths, for crossing: the *petite barrière* (small barrier) for small informal traders and the *grande barrière* (big barrier) for formal traders. At the *grande barrière*, the infrastructure is adequate and traffic proceeds in an orderly manner. At the *petite barrière* (Goma side), on the contrary, roads are in poor conditions and congested with vendors and stalls.

2) *Dealing with regulations and customs*

Dealing with complicated customs procedures is another issue often facing informal traders, who might have little knowledge of the formal processes and little access to specific information. Informal cross-border traders have low access to information. Language barriers might come into play (e.g. if documents are in English only). Beyond the language barrier, the information might be provided in a very technical jargon that informal traders do not understand (Saana Consulting, 2015a). This is exacerbated when traders are not very literate or are totally illiterate. For example, Tyson (2015) finds 16% of traders interviewed have not completed primary school.

Some traders' associations offer support to informal traders, but this is not always the case. For example, at the Busia border crossing (Uganda–Kenya), the Cross-Border Traders' Association initially blocked the establishment of the Women's Wing of the association, trying to maintain all the activities under the main association (Saana Consulting, 2015a). The Women Cross-Border Traders' Association was not able to obtain an office from which it could have provided assistance to women traders (ibid.).

A survey conducted by EASSI (2012) shows women traders in the East African region are not aware of customs procedures and regulations. In a survey of women-owned businesses in the EAC, Mbithi (2012) found many respondents were not aware of EAC trade rules and regulations, especially in relation to the exemptions offered for small traders. At some of the borders surveyed, as many as 92% of respondents did not know small cargos were exempt from import duties based on the use of simplified certificates of origin (EASSI, 2012).

Customs officers are often reported as looking down on informal traders (especially women) and considering them smugglers. At DRC's borders with Burundi, Rwanda and Uganda, to avoid interaction with customs officers, the vast majority of traders use agents to clear customs (Brenton and Isik, 2012). Those agents are often simply men who have learned how to navigate the system and do not always belong to a licensed profession.

Fees and duties are also an issue. Within RECs, there are usually no duties to be paid when crossing borders. However, charges other than customs duties (such as excise taxes, withholding tax and VAT) still apply. Informal

traders are not always aware of these charges, which can cause discontent among them (Saana Consulting, 2015a). For example, a survey conducted at the Mutukula border between Uganda and Tanzania noted that most women cross-border traders did not understand the calculations the Uganda Revenue Authority had applied to arrive at the total taxes levied on their goods. When asked for an explanation, the Ugandan customs officers used a language the traders did not understand, or asked them to consult online sources of information, which the traders have no access to. Tyson (2015) also found that, at the Busia border, traders reported being charged with custom duties on both sides of the border, making the total tax burden unbearable.

Access to finance is an issue for traders, as most of them have to rely on their own savings to use as working capital. Saana Consulting (2015b) reports that 82% of the informal cross-border traders in its survey resorted to own savings to finance their operations. Saana Consulting (2015a) reports that women cross-border traders in Busia (Uganda–Kenya) have limited capital and, hence, sometimes resort to pooling their shipments and resources, with a single trader crossing the border with a composite shipment to expedite clearing.

3) *Corruption and harassment*

Corruption is an issue reported in most surveys. It is striking that the payment of bribes is a regular occurrence for the majority of traders. Brenton and Isik (2012) report that, at the border between Rwanda and DRC, 100% of respondents said they had to pay bribes to cross the border. Many traders also reported having their goods confiscated (*ibid.*). Tyson (2015) reports that all of those who are asked for a bribe comply, because the alternative is having the goods confiscated or held for long periods of time at the border. Saana Consulting (2015b) found many Ugandan informal cross-border traders complained about the Tanzanian and Kenyan police being harsh and threatening them during the inspection of goods, and that this harassment was connected with bribery. In contexts where the majority of informal cross-border traders are women, sexual harassment has been reported as an issue at various border posts. Brenton and Isik (2012) report that, in their survey sample, the majority of traders were young women (85% of respondents, on average 32 years old) and experienced traders. Border officials, on the other hand, were more often men (82%; *ibid.*). These women often reported being victims of violence, threats and sexual harassment, but much of the abuse goes unreported (*ibid.*). While these incidents seem to be occurring regularly on formal routes, they seem to be more common through unofficial routes (Saana Consulting, 2015a).

2.2.2. How can the facilitation of informal cross-border trade improve the conditions of informal traders

While informal traders do not comply with regulations and official crossing procedures, they are still very important to the economy, both because informal trade provides livelihoods for the traders and their families but also because it allows households to access more varied and cheaper goods. When figures are available, they clearly show how informal trade provides an important contribution to the economy. For example, in 2012 Uganda's informal exports were 16% of total exports (UBOS, 2013).

During the past few decades, governments in developing countries have invested heavily in infrastructure to improve formal trade flows. Despite its importance for the economy, informal trade has not been high up on the policy agenda (Brenton and Isik, 2012). However, the very poor quality of infrastructure dedicated to informal traders facilitates harassment, bribery and violence (*ibid.*). Providing better infrastructure to informal traders could help alleviate these issues and allow cross-border trade to take place within the legal framework.

It should be noted that ensuring cross-border traders operate within the law does not necessarily imply they need to undertake a full formalisation process. It rather means informal traders could benefit from improved infrastructure that allows them to trade in a safe environment while at the same time complying with safety regulations that governments need to enforce. There are many examples of interventions that can improve the conditions for informal traders.

One of these is the use of two different crossing paths, one for large traders and their trucks and one for small traders. An example of such infrastructure was discussed above (the 'small' and 'large' border-crossing facility at the Gisenyi–Goma border between Rwanda and DRC (Brenton and Isik, 2012). There is still, nonetheless, an asymmetry in the condition of the infrastructure, resulting in greater levels of traffic at the larger crossing compared with the smaller crossing.

While not directly aimed at addressing informal traders' issues, the creation of OSBPs can also improve the conditions of informal traders. OSBPs bring together the different agencies involved in the checks and controls necessary for crossing the border (such as immigration, customs, agricultural and food safety agencies). In the presence of an OSBP, a trader has to stop only once at the exit border, during which all the immigration and other cargo-related red tape is addressed. Originally, OSBPs were intended to decrease the crossing time for formal traders, but they have proven beneficial for small traders as well. For example, Tyson (2015) found at the Busia border between Kenya and Uganda that 53% of the informal traders interviewed reported a positive impact of the OSBP on their livelihoods, as the simplified crossing procedure had expanded access to other markets and hence to a greater number of consumers. In addition to that, 36% of the informal traders reported a neutral impact. However, congestion and heavy traffic were still causing disruptions to trade, as large formal and small-scale informal trade was being processed through the same gateway (ibid.). Traders reported being displaced from the market area by trucks occupying their space.

Other measures focus on 'soft infrastructure' rather than hard infrastructure. For example, a number of countries and RECs have adopted simplified trade regimes aimed at reducing the number of documents to be completed and fees to be paid for small informal traders to cross the border with their goods. Lesser and Moise-Leeman (2009) note that COMESA has introduced a simplified trade regime for selected staple food commodities. In this regime, small-scale traders can use a Simplified Customs Document and a Simplified Certificate of Origin, under which goods that are (i) COMESA-originating and (ii) of a value that does not exceed \$500 per consignment qualify automatically for duty-free entry in the COMESA market (ibid.). Afrika and Ajumbo (2012: 7) argue that, 'unfortunately, small-scale traders are generally unable to access STR [simplified trade regime] benefits because of processing fees, low awareness on STR and its functioning and corruption'.

All these efforts are a clear indication that, while there are problems with the way small traders are dealt with at borders, solutions other than full formalisation are better to avoid bottlenecks at borders and to allow people to undertake their activities, thereby potentially increasing welfare and supporting poverty reduction in areas close to the border.

Finally, new initiatives combine new cross-border infrastructure with the creation of border markets (Republic of Uganda, 2015). Such initiatives are relatively new and their efficiency and impact on poverty reduction still have to be evaluated. Their principle is to allow scatter producers and traders to convene and gain bargaining power (Section 3.3 also discusses this topic). Indeed, in some countries, such as in Uganda, the common practice is that foreign traders come into the country and deal directly with individual farmers. As a consequence, the Food and Agricultural Organization (FAO) (2012) estimates that, in some years, only half of the potential maize export from Uganda is actually exported. Moreover, despite large aggregated quantities traded, most of the maize is traded informally. According to FAO (ibid.), in Uganda there is poor transmission of prices to producers (smallholders) preventing them from benefiting from potential high prices in regional and international markets for their produce (see Section 3.3 for a description of the regional maize trade). Considering that the maize market is highly liberalised in Uganda, the FAO concludes this is not the consequence of regulation issues but rather relates to the lack of an efficient maize marketing system resulting in disincentives to trade. Border markets are envisaged as one solution to bridge this market gap and to allow producers and traders to engage in cross-border trade, getting better prices for the former and without having to travel over long distances in the country for the latter.

2.2.3. Impact of cross-border trade facilitation on informal actors in East Africa

Although the interventions mentioned above have a primary role in supporting formal trade, they also have consequences for vulnerable groups.

Saana Consulting (2015b) provides an overview of the potential direct and indirect effects of the OSBP on the poor. Breaking down the poor into different economic actors, it examines how the introduction of the OSBP and integrated border management affects different groups:

- Small-scale formal cross-border traders: positive impact owing to reduced transit time and costs;
- Informal cross-border traders: potential negative effect if they are in competition with formal traders, as the latter benefit from the OSBP. If not in competition with formal traders, the introduction of the OSBP is potentially neutral to these groups;

-
- Truckers: positive impact as they will save time and expenses they might incur when they are delayed;
 - Formal and informal service providers around border posts (hotel managers and employees, retailers, mechanics, money exchangers): uncertain net impact. The OSBP can speed up transit time, thus leading these categories to lose business, but can also increase traffic, thus increasing the number of potential customers;
 - Local communities: possible displacement by the OSBP, but also a possible increase in economic activity around the border, providing new employment and business opportunities.

The potential indirect effects identified by Saana Consulting (2015b) are the following:

- Farmers: the net effect will depend on the increase in competition for their products, but also on access to larger markets (and hence increased sales) as a result of the OSBP.
- Wage workers: the net effect will depend on the effect on enterprises and farms where they are employed. The effect will be negative if the enterprises and farms face increased competition and positive if they are able to access a larger market as an effect of the establishment of the OSBP.
- Consumers and poor households: the effect on these groups will depend on changes in prices, which can decrease as result of the OSBP, and on their proximity to the market place.

Thus, the net effects are difficult to establish *a priori*. Production and consumption patterns as well as competition all need to be taken into account in the specific context under analysis. However, this framework is useful to assess the potential effects and how to mitigate the negative effects.

Recent surveys conducted on the OSBPs show how these have affected vulnerable groups in practice. As part of this project, Tyson (2015) analyses the impact on different groups of the Busia OSBP at the border between Kenya and Uganda. The survey involved both informal and formal traders as well as small service providers. She found the following:

- Informal traders mostly reported a positive impact of the OSBP on their livelihoods, mainly because the OSBP allowed them to cross more easily and to have access to a larger market. However, some of them lamented disruption to their business owing to the heavy congestion caused by the high volume of trucks.
- There are effects on informal workers, such as taxi drivers and porters transporting people and goods or loading and unloading trucks around the borders. These were the poorest group interviewed. A total of 41% of these day workers reported a positive effect of the OSBP. However, many of them also noticed a decrease in their business and difficulty in finding a job owing to the introduction of the OSBP, given the decline in hand-sorted trade.
- Formal traders and small business owners reported an overall positive impact of the OSBP, but 28% of them also reported a negative impact on their business, given a change in the number of customers using long-distance buses.

In line with the Saana Consulting (2015a) study, Tyson (2015) shows the results of the establishment of the OSBP can be both positive and negative for different members of each category, depending on a number of factors. However, once the negative impact has been identified, it can be mitigated through appropriate interventions.

It is important to note that the establishment of an OSBP, like every infrastructure intervention, shifts the allocation of benefits, creating winners and losers in the short term. However, the long-term dynamic benefits of this process should be identified. For example, on the one hand, an OSBP can reduce demand for informal workers to load and unload trucks. On the other hand, if the OSBP results in an increase in the level of activity and a scaling-up of informal traders, and if hotels, restaurants and other service providers in the area prosper as a result of the increased traffic after the creation of the OSBP, these activities might create jobs. Therefore, while informal workers might lose their current income-generating activity, the increase in economic activity could allow them to access more stable and remunerative occupations. The net result will depend on the level of substitution among job types.

2.3. Cross-border infrastructure: summary of findings and policy options to increase positive impacts and mitigate negative effects

We now bring together the two previous analyses of the general effects of cross-border infrastructure on the location of economic activity and of the specific effects of cross-border infrastructure on informal workers to draw out a range of policy implications.

The analysis of night light intensity shows that, on average, better cross-border integration and infrastructure reduces spatial inequalities. This is an important policy conclusion in its own right. However, facilitating market integration in remote regions requires innovative approaches to infrastructure and services development, to promote densification and support sustainable trade links. Policy can help sustain the reduction in spatial inequalities by fostering new economic activity hubs, for example through further investment commitments in rural areas and small urban centres to support closer markets for rural populations and increased access to public services. This could be through:

- **Connectivity infrastructure.** Investment in corridors could be complemented by investments in other smaller-scale connectivity and energy infrastructure to allow rural areas and small-scale cities to fully profit from and sustain the increase in economic activity that better cross-border integration allows. This could be hard infrastructure such as rural feeder roads, market places but also access to communication infrastructure as well as extension services.
- **Health and education infrastructure.** Access to public services is a major constraint in remote areas. The increase in economic activity and the economic development of smaller-scale urban centres throughout the country could make investments in health and education infrastructure more efficient, and presents an opportunity to increase access to public services. This would be beneficial for the relatively more vulnerable internal short- or long-term rural–urban migrants.

Analysis of the specific effects of OSBPs on informal traders suggests how different stakeholders involved in cross-border trade can gain or lose from changes in infrastructure influencing cross-border trade. While informal cross-border traders operate outside the legal framework, in practice they are deeply embedded in the economy, and they provide services and livelihoods to a large number of people. Their informality has a number of causes, including that it is difficult to comply with existing regulations while at same time being profitable. While efforts to formalise these businesses may not be successful or even desirable in the short run, it is still possible to facilitate their trade, allowing them to operate in a safer environment and reducing their vulnerability. In return, this could allow them to scale up and eventually take the formalisation route. Therefore, cross-border infrastructure projects should take the reality of trading at the border into consideration and integrate facilities dedicated to the border crossing of informal traders so they can easily pursue their economic activities. Several measures can be used to facilitate cross-border trade and ensure a safe environment, while at the same time complying with public health, safety and security requirements. These interventions target both hard and soft infrastructure:

- **Creating specific crossing points for informal traders carrying small cargos, separating informal traders from large cargos and trucks.** These cross-border points should be well-functioning and well-maintained paths and facilities to ensure smooth transit for informal traders, with their goods checked and specific procedures applied for small cargos. The presence of crossing points for informal traders without excessive documentation can reduce the use of illegal routes, and hence the possibility of theft and harassment. Such specific facilities could be a way to emphasise the importance of informal traders to the local economy and change perceptions of this activity among local authorities, which by itself could improve cross-border conditions and decrease incentives for bribery and harassment. An example of this is reported in Brenton and Isik (2012), who mention the presence of two different crossing points (a small and a large crossing point, for small informal traders and for formal traders, respectively). However, they note how these two paths are very different in quality: the one for informal traders is in a poor condition.
- **Increasing the monitoring of interactions between authorities and informal traders to address harassment, in particular for informal women traders.** The use of a border post, cameras and monitors can decrease the occurrence of bribes and harassment. The use of cameras at weighbridges, for instance, has considerably reduced bribery for truck drivers.¹⁵

¹⁵ Personal communication of the authors with the weighbridge operator in Busia.

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- **Making information on procedures and regulations accessible to informal traders through support systems able to address their questions in a timely manner.** This can be done first by addressing language barriers. The language revenue authorities and customs officers use has been reported as an issue because of technicalities as well as a lack of fluency among traders (such as at the Mutukula OSBP, as reported by Saana Consulting, 2015a). Authorities should adapt and translate essential documents and make sure representatives speak various languages. This includes national languages (e.g. Kiswahili in the cases of Kenya and Tanzania) but also local dialects spoken around the border. Second, targeted training provided either by traders' associations or by the customs authorities themselves would help empower informal traders.
 - **Engaging regularly with traders associations, to ensure the main issues affecting traders are discussed and addressed.**

3. RITF for participation in modern value chains and integration in international production networks

This chapter examines the link between RITF and value chain integration. We first review the literature on the benefits from participating in GVCs (Section 3.1). This is followed by an examination of the link between RITF and network connectivity in Sub-Saharan Africa, which provides new evidence on the importance of regional infrastructure for inclusion in international production networks (Section 3.2). Finally, we highlight how domestic soft and hard infrastructure are a necessary step to ensure inclusiveness and for the development of modern value chains (Section 3.3), and discuss the role of warehouses in Kenya as one specific example of how infrastructure can facilitate national and regional value chains in maize food staples. Section 3.4 concludes.

Box 4 below summarises the key findings presented in this chapter.

Box 4: Key findings on the effects of cross-border infrastructure on value chain development

This chapter explores how regional infrastructure matters for modern value chain development, and how such value chains affect growth and poverty through the firm and household channel (two core channels in the theory of change going from RITF to poverty reduction).

It reviews the literature on the benefits from participating in GVCs. The past few years have seen an expanding literature, which has explored linkages between GVCs and domestic SMEs, understanding how local SMEs can participate directly or indirectly in GVCs and can benefit from a series of positive spillovers of GVCs (e.g. through productivity increases or employment creation). The evidence suggests GVCs can lead to high value addition in exports, opportunities for SMEs to upgrade and increases in productivity through foreign involvement and learning by exporting (Section 3.1).

However, SMEs face challenges in taking part in GVCs, including a lack of information on standards and consumer preferences and cumbersome hierarchical relationships. More generally, Sub-Saharan Africa is relatively marginalised from world networks of value-added trade, and thus from GVCs. Few African countries have other African countries as their primary export market, and no African economy can be considered a hub of global commerce (Sections 3.1 and 3.2).

Improving infrastructure and trade facilitation is one way African countries can better connect to international production networks. Our research finds a clear positive association between both sets of policies and value chain connectivity, particularly in textiles and clothing. Among the various modes of transport, maritime and air connectivity are especially important determinants of value-added trade performance (Section 3.2).

The regional dimension matters as our research finds there is a strong positive association between infrastructure and trade facilitation improvements in neighbouring countries, and greater value chain connectivity at home. It is, therefore, not just what a country does that matters for its connectivity but also what its neighbours do (Section 3.2).

This supports the improvement of infrastructure and trade facilitation performance through implementation of the WTO Agreement on Trade Facilitation. But in particular, this emphasises the relevance of taking a regional approach to infrastructure development– which sits well with recent emphasis on economic corridors in some parts of the continent (Section 3.2).

We discuss the role of warehouses in Kenya as one specific example of complementarity within hard infrastructure and between hard and soft infrastructure to unlock coordination failure in the development of inclusive local and regional modern value chains. If properly managed, warehouses lead to (i) reduced storage losses; (ii) easier access to finance; (iii) increased liquidity; (iv) reduced trade margins; (v) reduced price variability; and (vi) improved ability for producers to mitigate price risks (Section 3.3).

Warehouses are a core part of the infrastructure necessary for food supply chain operations at the national and regional level, bringing together the following stakeholders: (i) farmers and aggregators (private individuals or cooperatives); (ii) warehouse operators; (iii) banks and other financial institutions; and (iv) exporters or traders (Section 3.3).

However, a range of challenges exist. For example, the lack of an appropriate legal environment is widely seen as the single most important barrier to the growth and acceptance of warehouse receipts in Kenya. Furthermore, smallholders face challenges accessing warehouses. While warehouses hold great potential, there is a lack of trust (Section 3.3).

3.1. The impact of GVC participation on growth and poverty reduction: potential for upgrading, productivity and employment

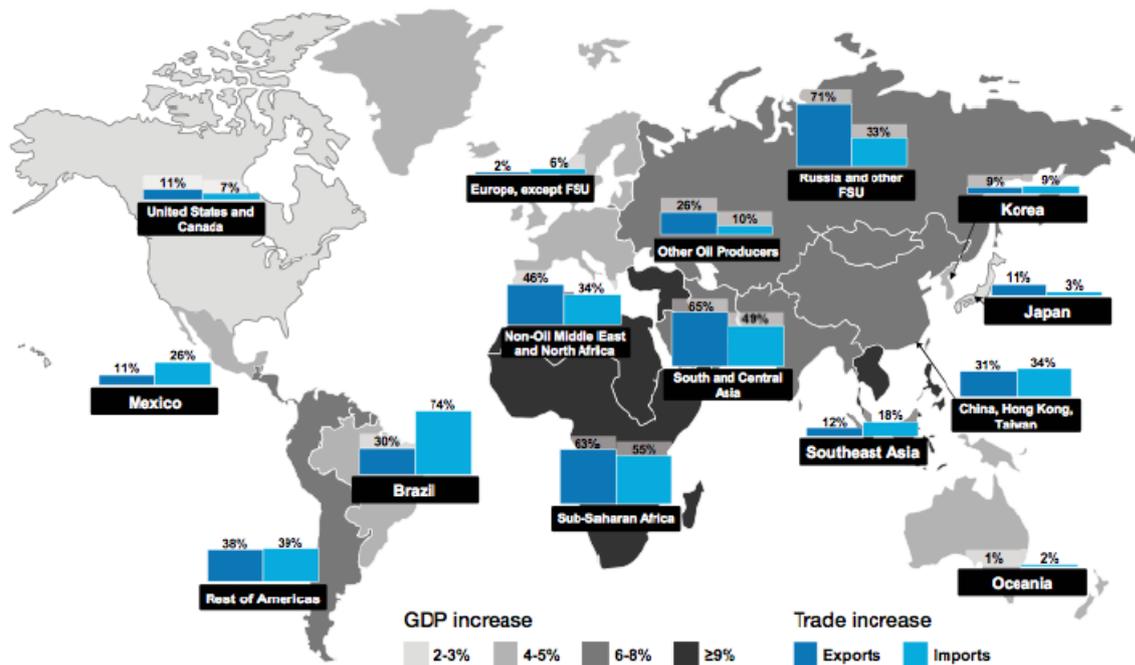
Global and regional value chains are an important way of organising production, trade and investment in a wide variety of sectors. The term ‘value chain’ refers to the full range of processes involved in the design, production and distribution of a final product. It stretches from far upstream – activities like research and development – to downstream activities such as assembly, distribution, marketing and after-sales. The distinctive property of *global* value chains is that these activities are spread across multiple countries, often in the same region, but sometimes also in different parts of the world. This new nature of trade entails that countries do not have to produce at all stages of a value chain anymore. GVCs allow them to focus on specific tasks of the value chain for which they have a comparative advantage.

The past few years have seen an increasing interest in the link between integration into GVCs and growth and poverty reduction. The literature in this area has explored linkages between GVCs and domestic firms, understanding how local SMEs can participate directly or indirectly in GVCs and thereby benefit from a series of positive spillovers (e.g. on productivity and employment). SMEs create employment for low-skilled workers that can contribute to poverty reduction and inclusive growth and is estimated to contribute between 80% and 90% of employment in developing countries (Bamber et al., 2013). SMEs also provide the fundamentals for economic development and economic transformation by transforming labour and natural resource endowments into capital and industrial infrastructure (Park et al., 2013).

3.1.1. The participation of SMEs in GVCs

Improvements in trade infrastructure can facilitate the participation of developing countries’ SMEs in GVCs. Taglioni and Winkler (2014) estimate that reducing barriers to trade in Sub-Saharan Africa could lead to an increase in exports of 63% and a potential gain of more than 9% in GDP. The quality and quantity of physical infrastructure (such as roads, ports, airports and railways) drives the capacity of SMEs to trade and successfully engage with and upgrade through GVCs (OECD, 2014). This increased participation in GVCs can, in turn, raise the productivity levels of SMEs.

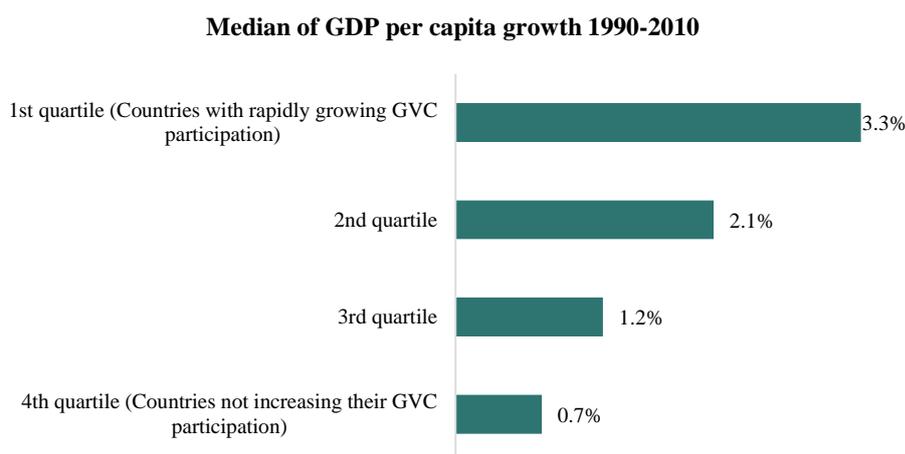
Figure 13: Comparison between GDP and growth in trade throughout the world



Source: Taglioni and Winkler (2014).

Regional integration plays a key role in facilitating the participation, directly or indirectly, of SMEs in GVCs. The theory suggests GVCs affect growth through the gains that participating firms can achieve through their capacity to specialise, improve their productivity, create new jobs and raise incomes. Evidence from the International Monetary Fund (IMF) (2013) points to higher value-added exports accruing from GVC participation, which is associated with higher growth rates. There is compelling evidence that developing countries that increase their participation in GVCs tend to have, on average, higher GDP *per capita* growth rates than those with lower participation in GVCs (Figure 14).

Figure 14: GDP per capita growth rates by quartile of growth in GVC participation, developing countries, 1990-2010



Source: OECD (2013).

This means countries where firms are increasing their level of engagement in GVCs tend to have higher levels of GDP growth. Entry into GVCs increases the opportunities for firms to increase output, sales and revenues. The impact of GVC participation works through three main channels: (i) the amount of value-added firms can capture

within a value chain through upgrading; (ii) the productivity effects of GVC participation; and (iii) employment effects.

Capturing a larger proportion of the value-added relies on the capacity of firms to upgrade their position within a GVC. To this end, domestic linkages, SMEs' participation and value-upgrading in particular are fundamental to how developing countries can capture a greater share of value-added within GVCs.

While they are playing an increasingly important role in global markets, the participation of SMEs in international trade faces a number of challenges. Infrastructure for trade facilitation plays a prominent role. The latest World Bank Enterprise Survey (WBES) data from Sub-Saharan Africa show 27% of firms regard infrastructure as a binding constraint to their operations (World Bank, 2015). The available data show developing country SMEs perceive themselves to be unprepared for the conditions faced in the global marketplace, making it difficult for them to enter new markets; the opposite is true of developed country companies, which have the resources and capacity to enter developing countries markets. Taking part in a GVC helps reduce these challenges and open up opportunities for developing country SMEs (OECD, 2008b) through main drivers, helping firms improve their pricing, quality, timeliness and production processes (Caspari, 2003). It can allow firms to increase their capacity to gather and use information on quality standards, allowing them to access particular markets as well as technology and skills to upgrade their production process and the quality of their products. Firms can also learn about consumer preferences in target countries, which would help them better tailor their products and production processes. Finally, it can provide a stable flow of regular orders that can help stabilise operations and provide a platform on which to potentially invest and grow.

The appropriation of value along a chain is not uniform. It varies between as well as within sectors and according to the value chain governance structure (Lee et al., 2011).

The majority of SMEs in developing countries are integrated into GVCs via quasi-hierarchical relationships. These relationships involve committing to a rigid supply chain, which often requires additional investment in order to comply with the demand of the lead firms. Such a relationship also creates one-sided economic dependence and can be risky in periods of downturn, when buyers often reduce their orders from GVC suppliers (UNCTAD, 2010).

However, even though such a relationship creates dependency and potentially raises operational risks, it also provides opportunities for SMEs to upgrade their production processes, benefit from know-how spillovers and open up new markets for expansion that could otherwise be difficult to access.¹⁶

3.1.2. GVC integration and productivity of firms

The participation of firms in GVCs can help them increase their productivity through positive spillover effects (IMF, 2013). A number of studies have shown that, when firms enter into GVCs, there are positive spillover effects that help raise firm productivity levels (Farole and Winkler, 2014). A review of FDI spillovers in developing countries shows there are potentially two different outcomes according to the type of firms involved in the GVC. For instance, there are negative spillover effects for domestic firms where multinational enterprises operate in the same sector (crowding out). However, there are positive spillover effects for domestic firms that supply to multinational enterprises but operate in different sectors (Gerschewski, 2013). For instance, in Mexico, Contreras et al. (2011) provide the example of a number of small local knowledge-intensive companies that benefited from the newfound demand for inputs created by a new Ford car factory.

In addition, where firms are entering export markets, there can be an overall productivity-enhancing effect as resources are allocated away from less productive firms (that exit the market) to more productive firms (Melitz, 2003). Research suggests a 10% increase in the export exposure ratio can lead to a 0.1% increase in labour productivity in developing countries (Kowalski and Buge, 2013). This evidence is also supported from similar results from Latvia (Smarzynska, 2002), which show a 10% increase in foreign presence downstream in a GVC results in a 0.38% increase in output for domestic firms that are a part of the supply chain. Therefore, engaging in trade has productivity-enhancing effects, which empirical evidence shows is particularly significant for firms both

¹⁶ The upgrading process can take four different forms, all of which can be used by firms within a GVC (Kaplinski, 2013; UNCTAD 2010): Process Upgrading; Product Upgrading; Functional Upgrading; and Chain Upgrading.

importing and exporting goods, in other words firms producing intermediaries in GVCs (issue also developed in Chapter 4).

Evidence from India confirms exporting firms have higher productivity (Mukim, 2011) but also highlight positive productivity-enhancing effects through learning-by-exporting for firms that maintain participation within export markets (Thomas and Narayanan, 2012). The same holds for Ethiopia (Siba and Gebreeyesus, 2014). Further evidence from Sub-Saharan Africa¹⁷ shows that, in the analysed countries, the productivity effect is mainly the result of producing at scale (van Biesebroeck, 2005).

Where firms export to can also matter. For instance, evidence from manufacturing firms in Slovenia¹⁸ points to productivity gains for firms entering the export market as well as greater gains when they are exporting to higher-income countries (de Loecker, 2007, 2012). There is similar evidence indicating that Japanese firms that export to the US and Europe have higher productivity gains than those that export to Asia (Ito, 2011). In the context of GVCs, this is also an interesting outcome, since developing country firms entering into a value chain tend to export goods to higher-income countries (at either the regional or the global level), which should result in comparatively higher productivity gains. We return to the effects of regional exporting on firm productivity in Chapter 4.

It is, however, important to note that not all studies show these positive effects. For example, analysis of firm-level data from Chinese manufacturing firms reveals no positive productivity spillovers from FDI (Hale and Long, 2007). Also in China, positive spillovers have been found to occur where domestic firms deal with foreign suppliers rather than where domestic firms sell to foreign customers (Liang, 2008). It is also important to keep in mind that GVCs may not be the only source of innovation for participating firms. A recent review of innovation in firms that belong to GVCs in developing countries shows only 20% of these firms exclusively use their GVCs as a source of upgrading; the remainder comes from other channels such as local educational institutions or firms' own investments in skills training (de Marchi et al., 2015).

3.1.3. GVC integration, employment and poverty reduction

There is a complex relationship between entrance into GVCs, employment outcomes and associated poverty effects. Recent literature has shown integration into GVCs can have positive impacts on employment creation, higher wage levels for workers involved in firms within GVCs and improved working conditions (IMF, 2013; Shingal, 2015). Such opportunities are fundamental components of poverty reduction in developing countries and can be especially beneficial through SME participation into GVCs.

Entrance into GVCs may also particularly benefit low- and medium-skilled workers. Evidence indicates that, at the global level, vertical specialisation, accrued through GVC entrance, has created a larger amount of low- and medium-skill jobs than high-skill jobs (Jiang and Milberg, 2013).

Although both pieces of evidence cannot be used to provide certainty about the fact that GVCs help reduce poverty, they do point out that there are potentially positive income and employment effects for the poor.

There is, generally, a positive link between entrance into GVCs and increases in wages. An OECD (2008a) review of the literature looking at FDI and wage outcomes shows participation in GVCs, set up by multinationals, has positive net wage effects. These effects are larger in developing countries and are also more significant if the firms in developing countries are directly owned by the multinational, although there are also positive (but smaller) impacts on domestically owned firms participating within the chain. International linkages could be an important part in wage determination, since data from Sweden¹⁹ show firms (whether they be domestic or foreign-owned) with international links pay higher than those that deal only with the domestic market (Heyman et al., 2004).

Labour skill levels may be important in determining wage outcomes. Evidence from both Mexico and China shows FDI led to increased wages for skilled workers rather than for unskilled workers. However, a breakdown

¹⁷ Using data from manufacturing firms in nine African countries.

¹⁸ Looking at firms that entered the export market, in the 1994 to 2000 period.

¹⁹ The data from this particular case study should be caveated since they stem from Swedish manufacturing firms, hence inherent pressures from strong unions, government legislation, etc. could have an equalising impact on wages between foreign- and domestic-owned firms.

in data from Indonesian manufacturing firms shows it may also be the case that foreign ownership affects wage outcomes, since foreign-owned firms tended to pay more, regardless of skill levels, than domestically owned firms (Shepherd, 2013). Further evidence from Thailand reveals that FDI tends to put greater upward pressure on high-skill wages, but the compositional demand for skill levels also matters, since GVCs that have greater demand for low-skilled workers can actually have larger (positive) wage equality effects (Shepherd, 2013; Tomohara and Yokota, 2011). Te Velde and Morrissey (2003) examine the effect of foreign ownership in five African countries and find it raises the skill premium.

Even though developing countries do not have extensive skills development systems, value upgrading through skills development does occur, thanks to a number of ‘complex’ local arrangements that have sprung up to facilitate skills development, often supported by firms, traditional educational institutions, local governments, international donors, non-governmental organisations (NGOs) and local industry associations (Fernandez-Stark et al., 2012). There is also the issue that there still needs to be absorptive capacity in developing countries for GVCs to have a beneficial impact. In other words, there needs to be sufficient human capital to facilitate economic and social upgrading (Taglioni and Winkler, 2014).

Finally, collective bargaining and advocacy (driven by trade unions and NGOs) also plays a role in terms of driving social upgrading. This cannot be discounted, and there are clear examples of these effects in Uganda (Evers et al., 2014), Bangladesh (Ahmed and Nathan, 2014) and Brazil (Funcke et al., 2014).

Even where upgrading occurs, positive poverty reduction effects are not guaranteed and, although value-upgrading can help raise worker wages, standards and rights, marginal groups may still be excluded (Lee et al., 2011). Evidence from Moroccan firms within the garment industry GVC points to the fact that upgrading has translated into social upgrading for the medium- and high-skilled workers but more precarious social outcomes for low-skilled workers (Rossi, 2013). Some more recent evidence does, however, point to the fact that social and economic upgrading do tend to occur in tandem in developing countries, through GVC integration (Bernhardt and Pollack, 2015).

In terms of gender outcomes, there is some evidence to suggest there are positive links between entrance into GVCs and female employment opportunities – where firms that become internationalised hire more women and give them greater employment opportunities (Shepherd and Stone, 2013). Even so, case study evidence from three sectors (horticulture, apparel and tourism) in Sub-Saharan Africa still shows disparity between males and females (Goger et al., 2014).

3.2. Infrastructure, trade facilitation and network connectivity in Sub-Saharan Africa

This section, based on the background paper by Shepherd (2015), does not seek to resolve the ongoing debate over the developmental merits of GVCs either generally or in terms of their specific effects in a particular country or region. Instead, it starts from the position that GVCs can – under the right circumstances, including the presence of appropriate flanking policies, such as investment in human capital development – offer important economic and development benefits to developing countries. Against that background, it examines how traditionally marginalised countries in Sub-Saharan Africa can join GVCs and improve their position in the global network of value-added trade. In particular, what is the role of regional approaches to infrastructure and trade facilitation policies? The rationale for addressing the regional dimension is that the networks of trade and investment that are at the heart of the GVC business model often rely on intra-regional connections, and movements of goods and capital across borders within the same geographical zone. As a result, it is potentially not just national performance in areas like infrastructure and trade facilitation that matters, but also regional performance. That term encompasses region-level measures such as economic corridors as well as regional spillovers from national initiatives or cooperative measures.

There are good reasons to believe that trade costs – including at the regional level – are a key determinant of the pattern of trade and production within GVCs. For example, Saslavsky and Shepherd (2014) show trade in parts and components – which typically takes place within GVCs – is more sensitive to improvements in logistics performance than is trade in final goods. Similarly, Ma et al. (2009) find China’s processing trade – a key part of its GVC participation – is linked to upstream and downstream trade costs. Infrastructure and trade facilitation are

important components of trade costs (Arvis et al., 2013), so it is reasonable to expect they would influence the ability of a country to connect with GVCs. Similarly, the regional dimension of GVC activity makes it plausible that it is not just national performance that matters but also the general level of trade costs in neighbouring countries (the region).

So far, we have not seen quantitative analysis of trade in value-added – an indicator of GVC trade – for Sub-Saharan Africa. Existing work on value chains in Sub-Saharan Africa is typically qualitative, or limited to analysing how value-added is divided up among different actors in the chain. Quantitative work on value-added trade has been limited to developed countries, and a small number of developing countries, mostly in Asia. Shepherd (2015) uses a new dataset to provide estimates of domestic value-added content in exports for two sectors, textiles and clothing and agriculture, for 189 countries, including 44 in Sub-Saharan Africa.

Recent applications of network analysis methods to economic phenomena (e.g. Acemoglu et al., 2012) are then used to construct a measure of value chain connectivity in the two example sectors, again for 189 countries. The index is calculated for 1996, 2001, 2006 and 2011. Performance is compared across regions, and Sub-Saharan Africa's position in the global trade network is clearly put in perspective.

National and regional measures of infrastructure and trade facilitation performance are used to analyse how these two variables determine value chain connectivity. Regional infrastructure is proxied by average infrastructure quality in neighbouring countries, given the lack of cross-country comparable data on truly regional infrastructure interventions, such as economic corridors. Nonetheless, the proxy measures are useful in that they capture cross-national spillovers related to infrastructure development, which is one dimension of the regional infrastructure challenge.

3.2.1. Data and analysis

The research used the Eora dataset, which brings together interlinked input–output tables for 189 countries, including 44 in Sub-Saharan Africa. The database covers 26 sectors, and the research is focused on textiles and clothing, and agriculture. Both sectors are of interest to developing countries in the low- and middle-income groups, and often represent feasible industries in the early stages of industrialisation. A number of Sub-Saharan African countries are known from case study work to be involved in value chains in both sectors, which reinforces the pertinence of this choice.

The advantage of a source like Eora is it can be manipulated to produce measures of value-added trade. Value-added trade data differ from traditional trade data in that they net out intermediate input use.²⁰ The study developed its own measures of domestic value-added in exports.²¹

GVCs are networks of value-added trade transactions, involving complex movements of goods and services across borders, usually multiple times. As such, network analysis methods can be useful in summarising the properties of the bilateral value-added trade matrix, and deriving numerical summaries of country performance that take account of all interactions in the network. Economists have recently turned their attention to the application of network analysis methods originally developed by applied mathematicians and computer scientists. These approaches can be used to better understand economic phenomena that take place in network contexts. For example, Acemoglu et al. (2012) model economy-wide input–output relationships as a network, and derive a simple, theory-based, measure of the volatility to which each sector is subject owing to shocks that occur elsewhere in the network. Shepherd and Archanskaia (2014) apply a similar intuition to a network of trade in value-added using data produced by the OECD and WTO. They use the concept of eigenvector centrality to summarise each country's position in the network. A country has a higher eigenvector centrality score if it is well connected to other countries that are themselves well connected.

²⁰ More information about data is available in Shepherd (2015).

²¹ The approach follows Koopman et al. (2010), who provide an encompassing framework for previous important contributions such as Hummels et al. (2001) and Johnson and Nogueira (2012). Using the Leontief inverse and identities from the input–output system literature, it is possible to derive a matrix of bilateral value-added trade flows for all 189 countries in the Eora database. Each element in the matrix represents the domestic value-added in exports from country *i* to country *j*.

This study similarly adopts eigenvector centrality as a measure of value chain connectivity for the textiles and clothing and agriculture sectors. It is calculated using the Eora data referred to above. Scores are therefore produced for all 189 countries in the database, including all 44 countries in Sub-Saharan Africa.

In addition to understanding the network character of GVCs that include Sub-Saharan African countries in sectors such as textiles and clothing and agriculture, an important part of this report is to understand the role trade facilitation, and particularly infrastructure, can play in enabling countries to better connect to GVCs. It is therefore also important to collect data on those two variables for as many of the 189 Eora countries as possible. In addition, an objective of this research is to examine the extent to which the regional dimension is important for developing value-added trade linkages through boosting infrastructure and trade facilitation performance, so it will be important to manipulate the data to produce regional measures in addition to own country measures.

Five infrastructure and trade facilitation variables have been identified as being of particular interest. The first is the infrastructure component of the World Bank's LPI (Arvis et al., 2015). It measures the quality of trade and transport-related infrastructure, and is based on a survey of international logistics professionals such as freight forwarders and express carriers. A second important piece of data is the Liner Shipping Connectivity Index (LSCI) produced by the UN Conference on Trade and Development (UNCTAD). This data series summarises each (maritime) country's ability to connect to international shipping networks in terms of volume, frequency and type of service. Third, and of particular importance to some GVCs, is the World Bank's Air Connectivity Index (Arvis and Shepherd, 2011). Created using network analysis methods, the index summarises each country's ability to access global air transport markets to move its goods rapidly across borders. Fourth, intra-African trade is often reliant on road transport, so it is important to have data on road network density. The length of the network is sourced from the CIA World Factbook, and country area (used as a deflator) is sourced from the World Development Indicators (WDI).²² Fifth, it is important to recall that soft infrastructure is also important to trade facilitation and connectivity: to that end, each country's average score on the OECD's TFIs is also included. The TFIs capture the extent of a country's implementation of core trade facilitation disciplines through regulations and procedures, and reflects its preparedness in terms of the WTO Trade Facilitation Agreement.²³

The value-added trade matrix is available for both example sectors for the years 1996, 2001, 2006, and 2011 (the latest year available in the Eora dataset). Infrastructure and trade facilitation data are not available for all of these years, so the econometric analysis is conducted on a purely cross-sectional basis for the year 2011.

3.2.2. How does regional infrastructure affect value chain connectivity: empirical results

Analysis of the bilateral value-added trade matrix shows African countries have their largest trading links with a wide variety of other nations, typically from other regions. Although there is some evidence of important intra-African trade links, the central economies for African trade in these sectors are nonetheless by and large Europe, Asia and the US. Africa's trade lacks regional coherence in the way that is seen, for example, in Asia, where intra-regional trade flows often provide a country's most important links to the global trading system. Of course, it is important to emphasise that the trade flows analysed are formal. If informal trade were to be considered, intra-African trade would be considerably larger than estimated. There would likely be a somewhat greater degree of regional trading identity for Africa, but it is unlikely that the core insight – that Africa's trade centres on other

²² Unlike the other indicators, the data on road network density do not capture strictly international connections – no data are available that do so. They are therefore used as a proxy only.

²³ The WTO Trade Facilitation Agreement, the first multilateral trade agreement to be concluded following the establishment of the WTO, was intended to streamline the flow of trade across borders. It sets out provisions designed to expedite the movement, release and clearance of goods, including those in transit; and establishes measures intended to facilitate effective cooperation between customs authorities on issues related to customs compliance and trade facilitation (WTO, 2016b). It is anticipated that the agreement will lead to sizable reductions in total trade costs – up to 14% for low-income countries and 13% for their upper middle-income counterparts (WTO, 2015). Importantly, the commitments made by developing countries and LDCs are linked to their capacity to implement the agreement, and the agreement explicitly states that these countries should be provided with assistance and support to build the necessary capacity.

regions – would be undone. In any case, reliable data on informal trade are not widely available, and it is not possible to quantify it in a cross-country setting like the one being used here.

Results from the calculation of eigenvector centrality measures for textiles and clothing suggest Sub-Saharan Africa countries are generally spokes²⁴ in the international trade network, with low connectivity scores. The average for Sub-Saharan Africa is only 0.003 in textiles and clothing, compared with 0.02 for the Middle East and North Africa (MENA) and Latin America and the Caribbean (LAC), 0.05 for Europe and Central Asia (ECA), 0.13 for South Asia (SA) and 0.31 for East Asia and the Pacific (EAP). The highest ranked Sub-Saharan Africa country is South Africa, with a score of 0.05, which is still quite low by world standards. These results suggest Sub-Saharan Africa is at real risk of being marginalised from developments in the GVC economy. The level and trend of scores in Sub-Saharan Africa are also of concern: in 2011, the region's score was only 1% of that of the leading region (EAP). Moreover, there has been a noticeable decline in its score since 1996. In part, this dynamic might reflect the reallocation of production that took place following the abolition of quotas under the WTO Agreement on Textiles and Clothing, a process that generally favoured the most competitive Asian producers and posed problems for less competitive firms in other regions.

A similar pattern is apparent in agriculture. Regional average scores are typically quite low, but they mask considerable heterogeneity across countries. Most regions exhibit an upward trend in connectivity, as measured by eigenvector centrality in the matrix of bilateral value-added trade. The best-connected region in this sector is EAP, followed by SA. It is of concern that Sub-Saharan Africa is by far the weakest performer of all the World Bank developing regions: in 2011, its value chain connectivity score in agriculture is only half that of the next lowest placed region, MENA. Its score is only about one twentieth as high as that of the EAP region. Moreover, there is little evidence of a trend in Sub-Saharan Africa: its score is essentially constant throughout the sample period. The general picture that emerges is one of marginalisation of Sub-Saharan Africa from the global network of value-added trade in agricultural products.

An econometric model is used to relate connectivity as measured by eigenvector centrality to measures of infrastructure and trade facilitation. Connectivity is very sensitive to improvements in both areas. A 1% improvement in a country's LPI infrastructure score is associated with a nearly 4% improvement in value chain connectivity, while a 1% improvement in trade facilitation performance is associated with a nearly 1.5% improvement in connectivity. Air and maritime connectivity have the expected positively signed coefficients that are statistically significant at the 1% level. A 1% increase in neighbouring countries' LPI infrastructure scores, the proxy for the regional dimension of infrastructure, is associated with a 5% increase in connectivity, while a similar improvement in trade facilitation performance is associated with a 1.8% increase in connectivity. Both magnitudes are larger than the own country effects, which is a striking result. These findings clearly support the view that it is important to move forward on infrastructure and trade facilitation at the regional level, and correspondingly that national developments can have important spillover effects for neighbouring countries. In terms of promoting GVC activity in Sub-Saharan Africa, these results suggest cooperative approaches at the level of regions can help reduce trade costs and boost GVC connectivity. On the assumption that GVCs can, under appropriate circumstances, be positive forces for development, this report suggests improving regional infrastructure and trade facilitation can, in turn, have positive implications for development in Sub-Saharan Africa.

3.2.3. Policy implications

This paper's key findings can be summarised as follows:

- Sub-Saharan Africa is relatively marginalised from world networks of value-added trade, and thus from GVCs. Given the high level of trade costs prevailing in Sub-Saharan Africa (Arvis et al., 2013), this result is no surprise. Even so, the magnitude of the gap between Sub-Saharan Africa and the best-performing developing region, EAP, is very large. GVCs are prevalent in developing Asia in many sectors, and they are still in their relative infancy in Sub-Saharan Africa. Nonetheless, Sub-Saharan Africa exhibits poor value chain connectivity in textiles and clothing as well as agriculture.
- African countries are reliant on external markets as sources of demand for their exports. Intra-regional links are relatively weak. Few African countries have other African countries as their primary export market, and there is no African economy that can be considered a hub of global

²⁴ See glossary.

commerce. Even the largest and most developed African countries are spokes in the global trade network – another example of the continent’s marginalisation in terms of value-added trade.

- Improving infrastructure and trade facilitation is one way African countries can better connect to GVCs. There is a clear positive association between both sets of policies and value chain connectivity, particularly in textiles and clothing. Among the various modes of transport, maritime and air connectivity are especially important determinants of value-added trade performance.
- When it comes to infrastructure and trade facilitation, the regional dimension matters. There is a strong positive association between infrastructure and trade facilitation improvements in neighbouring countries, and greater value chain connectivity at home. It is therefore not just what a country does that matters for its connectivity but also what its neighbours do.

These results have potentially important policy implications. On the one hand, African countries need to continue to improve infrastructure and trade facilitation performance, in the latter case including through implementation of the WTO Agreement on Trade Facilitation. Infrastructure is an area that has long needed attention in Sub-Saharan Africa, and the results of this study underscore its heightened importance in the era of GVCs. Joining and moving up in GVCs requires good gateway infrastructure, as well as strong connections to the hinterland. African policymakers, as well as donors and multilateral agencies, need to redouble their efforts in this area, including in the context of AfT.

Moreover, this paper’s results provide support for a regional approach to infrastructure development – which sits well with recent emphasis on economic corridors in some parts of the continent. A corridor approach recognises that infrastructure can have cross-border spillovers, and treats economic units that span borders as integrated wholes. In a general sense, this approach has much to recommend it, and the results reported here suggest its benefits can include helping African firms connect to GVCs (see the discussion in Section 3.1 on the benefits of participating in GVCs).

3.3. Developing more inclusive local and regional food staple value chains: insights from maize value chain in Kenya

The following section adopts a value chain analysis approach to highlight how investments in complementary trade-related infrastructure can support the participation of poor producers in modern retail value chains. This meso-scale analysis provides an understanding of how value chain stakeholders, including service providers and processors, are organised, and identifies potential political and economic coordination failures influencing the incentives of producers to participate in the market.

Every producer selling products on the market is connected to a value chain, whether at the local, national or international level. In the rural regions of developing countries, traditional and modern value chains co-exist. The former are often informal and consist of a multitude of often poorly coordinated actors and transactions. They are characterised by irregular product quality and a low level of transformation with no traceability. The end consumers are usually low-income rural and urban consumers.

Modern national and regional value chains have emerged simultaneously with urbanisation in most developing countries.²⁵ The process of modernisation of value chains entails increasing levels of organisation and coordination among stakeholders, as well as a degree of institutionalisation. In particular, such chains require the standardisation of the quality and safety of products to allow for the reduction of transaction costs along the value chain, and to meet consumers’ demand. Access to enforcement mechanisms and infrastructure is necessary to guarantee the level of quality and safety required.

Producing for the modern value chain can be an opportunity to generate new incomes in rural areas. However, it also represents higher initial costs and increased risks. Making modern value chains more inclusive as well as ensuring the maximisation of the benefits for poorer producers requires an understanding of the way power and rents are distributed and how risks are transferred in ways that often disadvantage smaller producers.

One way to redistribute value and benefits between various actors and, in particular, to benefit poorer producers is through a combination of targeted infrastructure and logistics developments, accompanied by policy reforms

²⁵ See the series of papers produced for the project Regoverning Markets. <http://www.iied.org/regoverning-markets-publications>

that allow them to ‘move up’ the chain and capture margins previously caught by other players (intermediaries/traders, wholesalers, processors and exporters). In East Africa, as in the rest of the continent, highly arbitrary political boundaries cut across agro-ecological zones and natural market sheds, with the region’s patchwork of inherited colonial boundaries impeding formal trade flows and separating regions that experience regular food surpluses from those that commonly experience deficits (Haggblade 2013).²⁶ Improving connections between population centres and food production areas would benefit both producers and consumers, and support food security. The recent development of local and regional agro-processing value chains in Africa demonstrates the potential for significant gains to accelerating these processes (UNECA, 2015; World Bank 2012). Improving trade in food staples – whether cross-border or domestic – can connect deficit and surplus areas and can reduce price volatility. Improving trade in food staples can be positive for consumers and producers, in particular smallholders, and can drive inclusive poverty reduction and improved food security. The existing literature examining the integration of the food staples market in Africa reflects the high level of trade costs both within and between countries in the region, echoing well-documented constraints in transport infrastructure, access to credit and the broader business climate. However, trade in food staples – whether cross-border or domestic – is essential for food security, and facilitating this can reduce price volatility for producers. Improving food staples trade can be positive for consumers and producers, in particular smallholders, and can drive inclusive poverty reduction. Facilitating the integration of food staples regional value chains through the development of infrastructure, addressing public and private NTBs (such as standards) and facilitating smaller producers’ participation in the value chain could therefore provide a further opportunity for inclusive growth and poverty reduction in the region.

Investing in the right infrastructure and supporting appropriate complementary regulations can assist in processes of economic transformation. Such regulations can address market failures in the value chain, reduce risk and, in turn, increase investments in the sector by stakeholders. Paired with sufficient training and support to enable farmers to access these warehouses, they can allow smallholders to participate in the value chain. This can not only increase employment but also allow farmers to capture greater value within supply chains.

This case study examines the role of grain warehouses in the East African region, and in particular in Kenya, for the functioning of the maize value chain, and argues that the evolving system of certification and receipting demonstrates an important complementarity between hard (physical) infrastructure and ‘soft’ infrastructure for the development and greater inclusiveness of the grain value chain, especially to allow a redistribution of benefits upstream in the value chain.

Globalisation and liberalisation of markets have led to the emergence of new players in the value chains for agricultural products. Demographic factors, particularly urbanisation, have influenced consumer preferences, which in turn have impacted domestic markets and supply chains. Supermarkets and large-scale retailers have become increasingly important.

The Kenyan value chain for maize, the country’s most important food staple crop, provides an important case in this regard. In Kenya, despite increased diversification in recent years, agriculture has continued to be the backbone of the Kenyan national economy. Agriculture accounts for 24% of Kenyan GDP and smallholders account for 75% of agricultural output, with 90% of rural households producing maize (KENFAP, 2011; Ministry of Agriculture and Kenya Agricultural Research Institute, 2009).

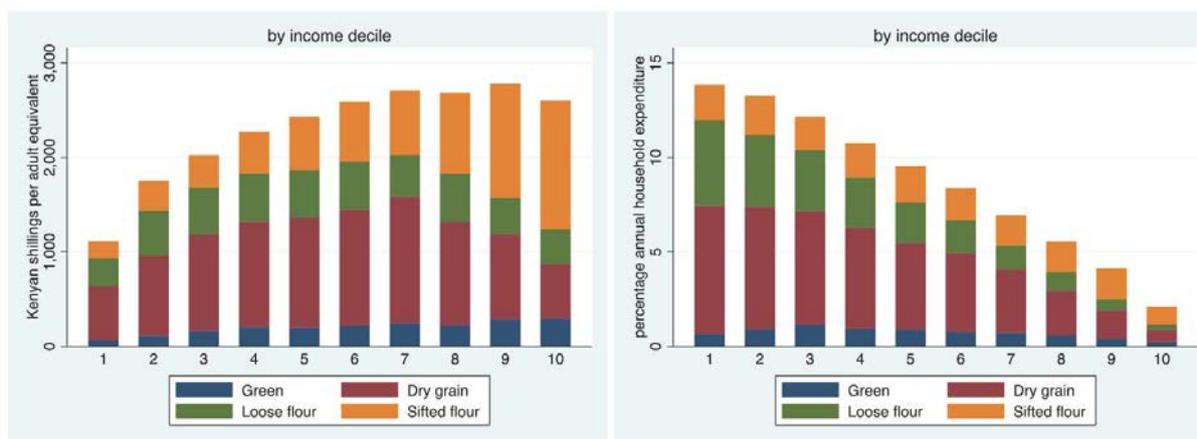
However, barriers to participation in markets remain particularly high for smallholders and a multitude of policy efforts have aimed to address high transport costs, poor infrastructure, limited connectivity and numerous other bottlenecks. Recently, the significant negative impacts of rising and highly volatile food prices, particularly of maize, during the 2008/09 crisis demonstrated the central importance of ensuring both that consumers can access maize and other staple goods at affordable prices and that producers have a greater degree of price stability. It further demonstrated the potential risks of beggar-thy-neighbour policies that restrict intra-regional and global trade and further exacerbate price shocks. Through an analysis of the changing organisation of the maize value chain, this case study will provide an overview of barriers to greater inclusiveness of the value chain. We focus

²⁶ Haggblade (2013) sees these problems as caused in large part by Africa’s ‘small-country problem’, which results in technology spillovers being dissipated as each country must invest individually in new technology development. The high transaction costs resulting from political borders and low perimeter infrastructure reduces farmer incentives to expand food production (p.159).

on (i) the role and relative market power of different actors; (ii) policy changes at the national and regional level; and (iii) ongoing investments in hard and soft infrastructure. Given the complexity of this issue, we examine one intervention in particular – the evolving infrastructure of Kenyan warehouse certification and receipting systems.

Smallholders are vulnerable to economic and climatic shocks and spread their risk by diversifying their sources of livelihood, often including significant off-farm income (BFA and FSD, 2015). In terms of both consumption and production, maize is by far the most significant staple crop. Maize is primarily produced domestically, but the country has an increasing maize deficit and imports the crop from other countries and particularly from Uganda and Tanzania (Kirimi et al., 2011). More than 3.4 million smallholder farmers plant maize. While maize yields in Kenya are greater than in many other African countries, they have declined in the past two decades by over 20% and remain below potential. Maize is a staple in the Kenyan diet, and is especially important for the rural poor, with low-income households on average being much larger net buyers of maize relative to their incomes (Argent and Begezo, 2015 – see Figure 15).

Figure 15: Maize consumption household expenditure per adult equivalent, and household expenditure share



Source: Argent and Begezo (2015).

Through an analysis of the changing organisation of the maize value chain, this case study provides an overview of barriers to greater inclusiveness of the value chain. We focus on (i) the role and relative market power of different actors; (ii) policy changes at the national and regional level; and (iii) ongoing investments in hard and soft infrastructure. To do so, this case study identifies how actors within the food staples value chain have been taking advantage of new opportunities enabled by improvements in trade facilitation infrastructure, trends in changes to regional and domestic policies and the broader institutional environment. The case study focuses primarily on one kind of trade-related infrastructure: grain warehouses. Given the complexity of this issue, we examine one intervention in particular – the evolving infrastructure of Kenyan warehouse certification and receipting systems.

We find evidence that, in order to reap the benefit of infrastructure investments, it is necessary to develop a complementary regulatory framework to eliminate coordination failures in the value chain and allow smallholders to integrate into local and regional trade networks.

This case study highlights how the provision of various services through certified warehouses can help increase both the volumes and the quality of traded food staples by allowing for the market integration of smallholders. However, it also acknowledges that various preconditions need to be in place for the success of this kind of infrastructure, including trust between actors along the value chain as well as improvements in the relationship between public and non-governmental actors, and increased transparency of agricultural and trade policies.

Specifically, we argue in this case study that the provision of warehouses combined with various services (including certification, quality assurance, training and linkages to input markets) could allow smallholders to not only take advantage of time arbitrage and thereby receive a better price for their products but also benefit from a reduction in post-harvest losses. In addition, third body certification of warehouses can increase transparency in terms of product quality for grains by ensuring the storage facility meets specific quality and insurance

requirements. As a result, it becomes possible to use stored grains as collateral for loans. This is the basis for the development of warehouse receipt systems (WRS). Such systems can provide loans to smallholders at a time when they are needed, ensuring they are not forced to sell their crops right after harvest when markets are flooded, and can thus take advantage of better prices later in the season (time arbitrage). It can also be used by traders or aggregators. For these intermediaries, such systems provide access to capital and increase their purchasing capacity. For instance, a trader interviewed emphasised that, because of the WRS, he had increased his purchase of bags of maize from 10,000 bags of 90 kg to 30,000 bags after the harvest season. Therefore, these systems can benefit not only traders but also farmers indirectly through the increase in demand by traders in a particular area.

In East Africa, and in particular in Kenya where the case study was conducted, warehouse development is not new and has not always been successful at benefiting smallholders. More recently, while the private sector was able to promote what appears to be a successful warehouse certification scheme, the scaling-up of the initiative still requires additional investments as well as a clear regulatory framework.

After explaining further the different types of warehouses and warehouse services available in Kenya, and how they can potentially be a catalytic form of infrastructure for the inclusive development of the local and regional maize value chain, we describe how they benefit various actors in the chain and explore how and under which circumstances they can support an upgrade and scaling-up of the maize value chain and the development of regional trade.

3.3.1. Warehousing as a *potentially* catalytic infrastructure

Types of warehouses available in Kenya

Warehouses are a core part of the infrastructure necessary to facilitate the functioning of the food supply chain. They can be managed under various schemes and we focus here on the example of two types of warehouses in Kenya: state-owned and -operated warehouses and private warehouses that are certified by a non-governmental membership organisation, the Eastern African Grain Council (EAGC).

State-owned warehouses are primarily used for grain storage in order to ensure access to staples in emergency situations. They are managed by the National Cereals and Produce Board (NCPB) with over 118 warehouses spread across 46 of Kenya's 47 counties and are reported to have a capacity of about 2 million MT (21 million 90 kg bags) of grain at any given time. Of this capacity, 25% is bulk handling in silos, while 75% of the grains are stored in bags. The concentration of the facilities is linked to the major grain production areas. The NCPB currently uses only about 60% of its storage capacity. The remaining storage capacity is leased to grain millers, traders and development partners and NGOs such as the World Food Programme. There is also a strong presence of storage facilities in food-deficit areas.²⁷

The certification of warehouses means they must meet strict specifications related to their construction operation, management and insurance. Certified warehouses will only accept grains meeting specific quality requirements, ensuring they can be stored for months and will not contaminate other grains. The certification is, therefore, a signal to stakeholders in the value chain of the quality of the stored goods in the warehouses, ensuring the option of using stored grains as collateral. This system brings together depositors (who can be both farmers and aggregators), warehouse operators and an insurance provider.

The benefits of developing access to such certified warehouses and to the development of related services are to improve access to financing; reduce post-harvest losses; promote quality management, grading and certification services; allow for time arbitrage and reduce price risk; increase transparency; and facilitate trade between producers and other actors in the value chain.

Warehouse receipt systems as a way to address coordination failures in the maize value chain

Financial institutions are important players in the maize value chain, providing credit for a number of activities, including farm inputs, trading and processing. Smallholders' access to financial services is curtailed by a number

²⁷ However, according to interviewee accounts, of the 2 million MT storage facilities capacity, only about 1.7 million MT capacity is currently in usable condition, as many of the storage facilities are very old and cannot be used and some facilities are located in remote areas and rarely receive grains.

of factors, including difficulties with the loan application process and fears of the consequences of defaulting.²⁸ Since most smallholder farmers can only access loans as a group, one farmer defaulting has consequences for all group members. Financial institutions are also reluctant to lend to agri-businesses in general, which they perceive to be risky, and to small farmers in particular, given their lack of collateral and the high transaction costs involved of servicing small loan amounts. Furthermore, many smallholders cannot afford the high interest rates. Local banks are critical to ensure the WRS is operational and play an important role in financing a number of activities, including the purchase of farm inputs, marketing and processing. Access to financial services by smallholder farmers is, however, limited because of various factors, including lack of information, lack of appropriate collateral, tedious loan application processes and fear of defaulting.

One type of service that can be developed by warehouse operators in association with banks is the WRS.

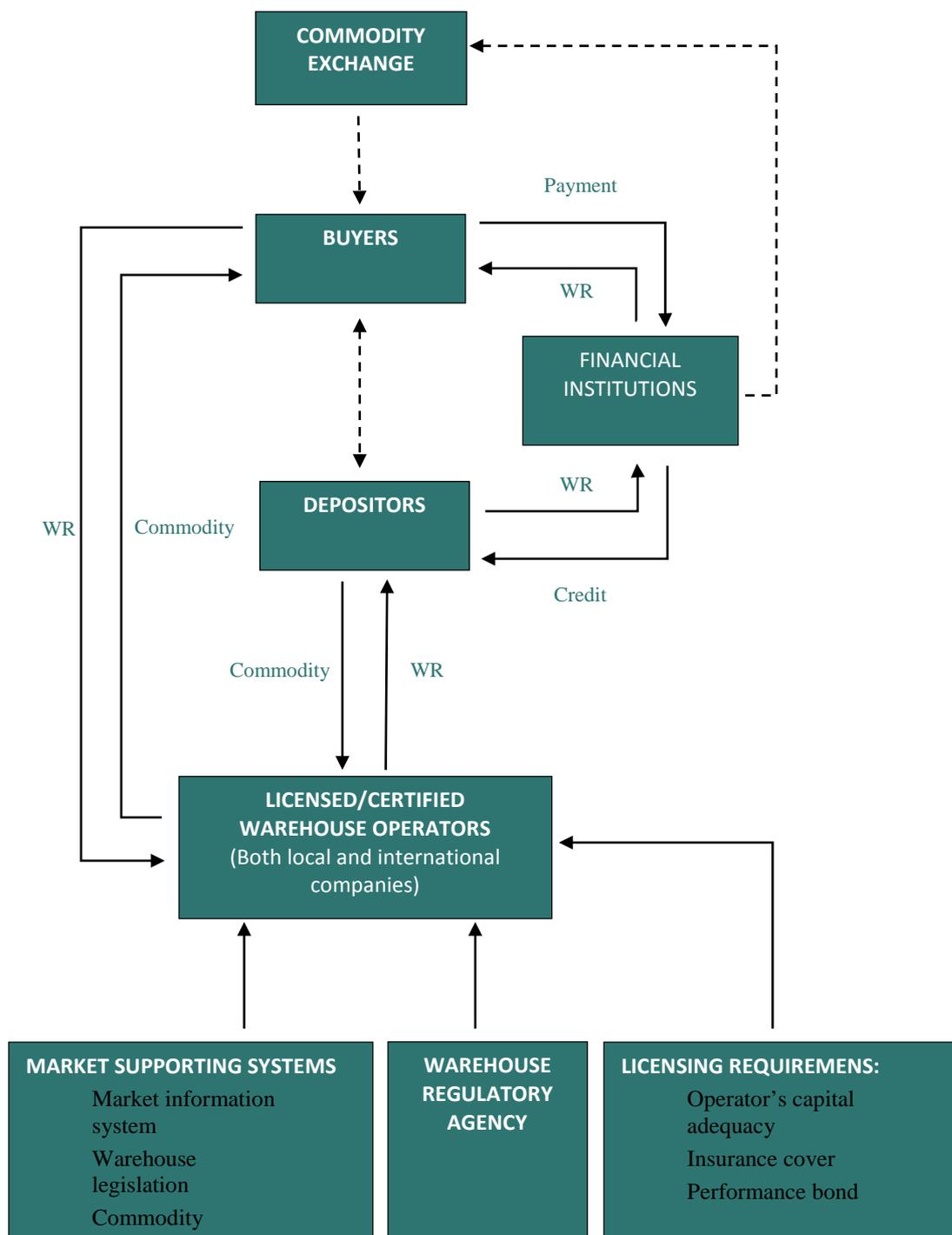
The development of a functioning WRS requires the involvement of financial institutions in addition to the other actors of certified warehouses. The use of an independent warehouse operator helps prevent conflicts of interest and is a guarantee for banks that goods will not be sold to multiple actors and the products will be stored under specific standards. However, under certain schemes, warehouse operators are also the aggregator. This is usually the case for farmer cooperatives, where aggregation is carried out among designated leaders within the group. This creates a potential conflict of interest and banks have been reluctant to support the creation of WRS with such warehouses.

Such a system allows farmers or traders (depositors) to store their grains in a warehouse for a period not exceeding 12 months. The warehouse operator provides depositors with a warehouse receipt representing the deposited goods (stating quality and quantity on the receipt) that is then used as collateral to receive a loan from partnering banks (usually approximately 60% of the current market value of the deposited grains). This allows farmers to access credit, relieving liquidity constraints, and to increase the number of operations traders can manage, thereby increasing the amount of grain they buy from farmers after harvest. Depositors can then fetch higher prices for their produce later in the year, or may simply have more time to connect with competing buyers from diverse markets. Under ideal conditions, and if properly implemented, the WRS can therefore simultaneously increase access to finance for both farmers and traders, increase smallholders' income by upgrading production quality, reduce post-harvest losses both through the supply of training and the supply of good quality storage facilities and stabilise and even increase producer prices thanks to the reduction of trade margins (see Coulter and Onumah, 2002, for an overview). Finally, it allows producers to mitigate price risks. Other studies mention that warehousing is also a method to shorten marketing chains by allowing producer groups to sell directly to processors, large traders, exporters and importers (Onumah, 2003; Höllinger et al., 2009).

Depositors can also hypothetically sell directly to buyers or through a commodity exchange (though this system does not yet exist in Kenya – see Section 3.3.3). Here, the warehouse operator guarantees delivery of specified quality and quantity against the receipt. The depositor pledges the receipt to a lender and later arranges sale either through the commodities exchange or directly with a buyer. The buyer in turn makes direct payments to the lender to obtain the receipt, allowing them to take possession of the underlying commodity. In case of default, the lender can sell the receipt through the exchange – the financing contract should allow lenders to liquidate the receipt without litigation (see Figure 16).

²⁸ Many interviewees, from farmers to traders and warehouse operators, mentioned that many farmers in the region had had difficult experiences with microfinance schemes and were very suspicious of any form of loan. However, once the system was explained through training some changed their mind. This factor can explain the slow progress of the WRS.

Figure 16: Schematic of regulated warehouse receipt system



Source: Onumah (2010).

Giovanucci et al. (2000) argue that a functioning WRS relies on the following key aspects for success:

- Prices should increase after the harvest season in order to cover storage costs (though this is generally not the case if government intervention protects the market through subsidies).
- Good information must be available on prices and crop forecasting for sound decision-making.
- A legal infrastructure needs to recognise warehouse receipts as equivalent to stored commodities.
- An adequate licensing and moderating system is necessary to ensure the infrastructure meets basic physical and financial standards.
- Adequate grades and quality standards must exist to assess the quality of the commodity.

- The country must have a viable storage industry.
- There needs to be system to guarantee the performance of warehouses.
- It is essential that banks, that provide the finance, trust the system.

According to Lacroix and Varangis (2012), in order to work, warehouse receipts must be recognised by law and have performance guarantees, regular inspections and a process for crop quality determination. This results in a clear set of roles for the different players involved. For instance, public authorities are responsible for passing laws; the public and private sector can set up licensing systems and performance guarantee systems as well as establish quality standards. Farmers and processors should have an ongoing system of feedback and should know the intricacies of the system. Local banks should have clear internal procedures, including a system for monitoring commodity prices. Finally, systems should support the training of warehouse operators and inspectors, advise on draft legislation, help set up performance guarantee systems and draw on best practices from other countries.

In this context, the implementation of WRS in Sub-Saharan Africa can be challenging, as it requires close collaboration between government and the private sector. In particular, Lacroix and Varangis (2012) argue there is generally a lack of incentives for the development of a private storage industry owing to government intervention in agricultural markets, including price-setting that takes insufficient account of variations over time or in different regions to allow for profitable storage; lack of an appropriate legal, regulatory and institutional environment to support a system of warehouse receipts; and limited familiarity of the country's commercial community, including banks, with warehouse receipts.

The Kenyan warehouse receipt system

Warehouse receipting was introduced in Kenya in 2008, at a time when maize went from being in excess supply to regular shortages. High consumer prices motivated impromptu government directives, which in most cases distorted the maize market. Maize growers in most parts of Kenya were receiving bountiful harvests from the government's inputs programme, the National Accelerated Agricultural Input Access Programme (FAO, 2012).

Currently, the country functions with a dual WRS – one operated by the government through the NCPB and one through the EAGC. The EAGC's WRS was rolled out in April 2008 on a pilot basis for maize grains until 2011 with one warehouse (Lesiolo) in Nakuru. The pilot phase was funded by the UK Department for International Development (DFID) through the Financial Sector Deepening (FSD) project, which has supported the WRS in partnership with the EAGC since 2008. The system was also supported by the Swedish International Development Cooperation Agency (Sida), USAID and the Regional Agricultural Trade Expansion Support Program (RATES) at different stages, with the EAGC in charge of ensuring warehouse quality and facilitating the honouring of warehouse receipts as collateral by banks. DFID mainly assisted the EAGC in the development of WRS modalities, including protocols and certification criteria covering capital adequacy, insurance cover and general warehouse management, among other issues.

The EAGC's presence extends beyond Kenya. According to EAGC interviewees, the WRS works well in Uganda in the case of maize because it is mainly grown as cash crop. In Tanzania, the WRS has succeeded well for coffee and cashew nuts but failed for maize. The EAGC WRS is seen as a potentially effective platform to link regional trade, but this depends on conditions such as certification and standards adherence. With respect to the EAGC system, the organisation has been working on involving smallholder farmers in the WRS. The EAGC has established a system for certifying warehouses to receive grain deposits and issue transferable warehouse receipts. A conventional set of certification criteria has been developed covering capital adequacy and insurance cover, among other issues. Certification is provided on the basis of documentary information and the due diligence of inspection companies – requirements are set out online and through brochures distributed to farmers and warehouse operators. The problems of bank support, often the bane of a nascent WRS, appear to have been largely overcome, as one bank has already committed to the product while a further four are interested.

3.3.2. Who is benefiting from WRS?

The two types of warehouses, managed by NCPB or private and managed by EAGC, have very different functions and impacts. In EAGC warehouses, which follow strict guidelines and standards with respect to certification, post-harvest losses are assumed to be in the area of 0.2% according to a recent evaluation. This, in addition to the possibility of conducting time arbitrage, has resulted in significant productivity gains, and in turn income increases

for farmers utilising these (though the precise scale of these is not yet known). However, many farmers remain reluctant to borrow against the warehouse receipt and feel the WRS is too risky. This is not unreasonable, with many loans having annualised interest rates of 18-20%.²⁹

Nevertheless, interviewees indicated that they felt reassured about the system once it was explained in greater detail through training programmes. Indeed, many stakeholders mentioned one constraint to smallholder adoption was the lack of information in communicating the benefits and risks of the system. A second issue mentioned was transport cost. Various smallholders, farmer representatives and traders highlighted the barrier represented by transporting grains from the farm gate to warehouses. Some even mentioned that the issue was not the provision of roads *per se*, or the availability of transport services, but rather the transport price, which, according to interviews, is the consequence of collusion between truckers to keep prices high even in times of low fuel prices. According to some aggregators, transport cost is one of the reasons they did not manage to reach full storage capacity as they rely on farmers bringing their crops to warehouses. As a result, operators have been seeking to invest in trucks in order to increase the amount of maize they can access in their community.

Traders interviewed have been able to considerably increase the amount of maize they trade and highlighted that, for the moment, there was often not enough capacity in certified warehouses. They also mentioned that training allowed farmers to have better-prepared grains to sell. There is no mention of any premium for quality production; however, traders said they would pay a competitive price for good-quality products and bargain for lower quality. One trader mentioned that the difference could be between KES 100 and 200 per 90 kg bag. Interviews with millers also highlighted their satisfaction with products purchased in certified warehouses, and in some cases argued for a scaling-up of the system.

The NCPB is also implementing WRS. However, in addition to the poor quality of storage conditions that does not guarantee the preservation of collaterals, warehouses managed by NCPB are not considered to be managed independently, particularly because the government sets prices and no legal recourse has been available defining responsibilities in case of dispute between parties. Therefore, banks have not been keen to participate in this specific scheme and to lend against receipts from NCPB warehouses. For NCPB warehouses, informants have estimated post-harvest losses at total approximately 30%. The NCPB storage is primarily considered a political tool to both create strategic grain reserves and provide farmers with higher prices than on the market. There is recognition among government actors that considerable investments are required to bring NCPB warehouses to a higher quality level, so receipts can be accepted as collateral in these cases.

Detailed evaluations of the socioeconomic impact of warehouse certification (and of the WRS specifically) are still lacking, but some initial results are available. A study by Njehia et al. (2013) looked at the socioeconomic factors influencing farmers' participation in grain warehouse focusing on Nakuru district. It found six variables strongly influenced this. Specifically utilisation is more likely for (i) male smallholders; (ii) smaller households; (iii) those closer to warehouses; (iv) larger land size; (v) higher off-farm incomes; and (vi) participation in farmer groups. Similarly, a study by the Kenya National Federation of Agricultural Producers (KENFAP) examined several banks and their attitudes towards the WRS, identifying constraints to smallholders when seeking finance and insurance. While banks and insurance companies have refocused their attention towards agriculture and consequently developed products for the sector, services are largely not accessible for smallholder farmers. The study estimated that 90% of beneficiaries of WRS in Kenya were large-scale farmers and only 10% of smallholder farmers in organised groups had access to storage. It advised that more capital investments were necessary to facilitate access, as well as a regulatory agency to harmonise infrastructural development in rural areas through significant investments, in some cases involving rehabilitation or building of storage facilities.

Finally, based on interviews, a recent evaluation found the minimum quantity required for deposits (e.g. 10 90 kg bags for some interviewed warehouse operators) means small farmers cannot access these individually. However, there have been more farmers willing to aggregate within cooperatives to ensure they reach the minimum tonnage to access warehouses. In the eyes of some interviewees, this trend should be further supported through a hub-and-spoke model, with smallholders aggregating production and then delivering to warehouses (see Box 5). As such, one EAGC-certified warehouse operator interviewed for this case study claimed to have over 80% of its maize sourced from smallholder farmers that had organised themselves into groups. A more robust evaluation is

²⁹ This, according to one interviewee, is a much larger national problem, with the government needing to address the credit market for smaller borrowers.

currently in progress, but indicative results suggest farmers were able to increase their productivity substantially as they could buy inputs at critical points during the season.

Box 5: The evolution of a hub-and-spoke model through farmer cooperatives and community-based organisations

While still in nascent stages, there has been a push by several community-based organisations (CBOs), with the support of the EAGC, to aggregate grain locally and then use certified warehouses collectively. In the words of one farmer near Eldoret who has begun operating one of these aggregation centres:

It was very difficult to bring this to market – most farmers had 5-10 [90 kg] bags and transportation costs would take up two bags. So the farmers were always at the mercy of middlemen who exploited them. They know they cannot access markets and come right at the harvest with a very low price. For example, in 2014, the lowest prices paid by these middlemen were KS 1,400 while millers were paying 2,200-2,500 and the NCPB up to 2,800. With a cost of production of 1,200-1,800 (including ploughing, bags, seeds, etc.) this means the margin of profit is minimal. And most farmers could produce about 22 bags/acre.

We allow them to borrow at interest rate of 10%, we help them bring in the maize, clean and repack. We also provide the fertiliser through the government support programme and we offer capacity-building. The CBO buys from members who want to sell, not deposit it. Generally we look at the market price, the trader price and the NCPB price and come in somewhere in the middle. There were very few initially – we had problems of trust and fears about mismanagement. So they worried that, if it is deposited, how will it be taken care of, etc. But it has grown. In 2006 we had 600 bags, in 2013 it was 1,200 bags and in 2014 it was 3,000 bags.

The EAGC is a trustee of our CBO. We collect and aggregate here. Then we bring it to [the warehouse operator] to receive the maize, grade it, etc. There we get an EAGC-certified warehouse receipt we can take to the bank. The bank gives us 65% of the deposit based on current market prices. We deposit this as a CBO and have an elected board that makes resolutions on how to handle maize, makes payments to the clerk, etc. This has four benefits. First, we no longer have the problems with traders. Second, they don't spend money as irresponsibly, because they first get 65% at harvest season but then also can buy fertiliser, seeds, pay for school. And the remaining 35% comes later. Third, if the price of maize increases, they can improve their livelihoods. Fourth, they get the real weight from the digital scale – often the traders will use tampered scales.

3.3.3. Soft and hard infrastructure for the creation of a regional commodity exchange?

One initiative that has been repeatedly put forward to address the lack of transparency in grain markets (and commodities at large) is the establishment of a regional commodity exchange. Such an exchange requires the implementation of harmonised standards (or at least mutual recognition) within the region as well as adequate storage capacity. The standards harmonisation that occurred in the EAC and the development of certified warehouses are first steps towards the introduction of a commodity exchange in the region.

The introduction of the commodity exchange, through the Kenyan Capital Market Authority, is seen by banks and traders as a way of limiting government involvement in price formation, and allowing traders and producers to trade freely on a daily basis.³⁰ The commodity exchange platform would work directly with traders and farmers, in a complementary process to the WRS.³¹ As such, the exchange would be an important signal to improve transparency, with actors along the chain aligning with the price set in the exchange. For this to work, improved market information and a high level of transparency are important.

³⁰ Although the government appoints directors to the Capital Market Authority, the authority is an independent institution and operates according to global standards.

³¹ The establishment of an exchange may even make the WRS law irrelevant according to the new setting of the law as everything would go through the commodity exchange.

However, this process has been mired in controversy in the past few years. The Kenya Institute for Public Policy Research and Analysis, one of Kenya's leading think-tanks, was commissioned in 2012 by the Ministry of Agriculture to determine whether Kenya was ripe for a commodity exchange (Laibuni et al., 2012). The findings were that Kenya cannot sustain a commodity exchange market because of:

- Limited produce supply;
- Weak transport infrastructure to bring goods to the exchange and as well as uncertainty about the regulatory climate;
- Lack of assurance on quality and quantity;
- Lack of effective insurance coverage;
- Limited weather stations to receive accurate weather information for insurance purposes;
- Limited use of the available price information data by producers. Price data from the Regional Agricultural Trade Intelligence Network and other sources are available. However, whether the farmers have benefited from the information is not yet known.

While the EAC region has harmonised maize standards, interviews highlighted the difficulty of implementing this harmonisation in the region. Various issues were mentioned, but the different interpretation of standards between countries in the region is particularly problematic (e.g. on grain colour), as is a lack of capacity, with not enough skilled staff for grading processes.

It is possible that, in the interim some of these issues have been addressed, and the EAGC has – as in the case of the WRS – been pushing forward for the establishment of such an exchange. As in the case of the WRS, it will be necessary to establish a functional regulatory framework and also to minimise the interventionist role of the Kenyan government in grain markets to ensure trust in the price formation process. As such, some interviewees have argued it may be better to start this system with crops that have a less essential role as consumption goods (such as coffee and other cash crops) and move to maize later. That said, Kenyan policymakers have taken note of the establishment of a commodity exchange in Kigali and are keen not to be left behind in this process. Thus, a regional exchange could address the already vibrant regional trade, as long as the highly varying levels of product quality can be dealt with. Kenyan millers interviewed for this study who import grain from other EAC countries argued grains from Uganda and Tanzania tended to be of much lower quality.

3.3.4. Understanding the politics of grain warehousing

These issues point to the fact that not only will infrastructure investments be necessary to enable greater smallholder benefits from the emerging WRS but also, under the current system, there is inevitable conflict and the ongoing process to legalise the system requires a much clearer legal framework (FAO, 2013). The lack of an appropriate legal environment is widely seen as the single most important barrier to the growth and acceptance of warehouse receipts in Kenya. In order for a warehouse receipt system to be viable, the legal system must support receipts as secure collateral.

This is linked to a broader dynamic – the ‘credible commitment problem’ – integral to the political economy of agricultural policy of many African countries (Tschirley and Jayne, 2010). Neither government nor private sector actors trust each other and, in turn, they base their decisions on how they expect the other to behave, with no third party available to provide guarantees or predictability (see Engel and Jouanjean, 2014). Beyond this, in Kenya, as in many other countries, food staples have a strategic function and are central to the social contract. Agricultural policy tends to favour urban consumers over rural producers, with the latter often concentrated in cities, where political action, coordination and enforcement costs are more favourable than in the rural areas where farmers reside (Anderson et al., 2013). This credible commitment problem is thus central to the inadequacy of functional grain storage options and, paired with private sector concerns over manipulation of national crop production estimates and food balance sheets, this exposes the private sector to huge risks of financial losses and leads to reluctance to invest.

In this context, the slow movement towards a clearer regulatory framework governing the WRS has been an important step forward. Legal experts have been reluctant to endorse this type of financing without a formal set of rules and regulations in place. This demonstrates the need for a law that clearly outlines the rights, liabilities and duties of each party to a warehouse receipt, including the farmer, the bank and the warehouse employee. Producers, traders and bankers also need maize pricing parameters in order to make appropriate credit decisions.

The existence of a law that defines the parameters of warehouse receipt financing would give banks more latitude in adopting the appropriate policies and procedures for the development of lending and collateral management strategies. In addition to ensuring warehouse receipts are freely transferable by delivery and endorsement, the warehouse receipting law should clearly define collateral security issues and be made complementary to other statutes governing financing and the security interests of creditors.

At this stage, this political process has moved forward, albeit slowly, as it relates intricately to the future government role within grain markets (and specifically of the NCPB). There have been proposals to split the agency into three entities – a commercial arm, a strategic body and one that manages the WRS – since under the current model the WRS will not work given the price disruption caused by frequent and unpredictable government interventions. In this regard, the cabinet (represented through the Ministry of Agriculture) may be seeking a more liberalised system than the NCPB is likely to be willing to cede.

The regulatory process has been supported by the International Finance Corporation (IFC) and other donors, and it is hoped that, despite these obstacles, by late 2015 or early 2016 a new WRS will be passed by parliament. While in the view of the EAGC the bill was developed with insufficient consultation and ignored stakeholder views, it is – in the eyes of observers – sufficient to address the overarching problem of legal uncertainty.³² However, this will also have to provide a framework for the future of the parastatal NCPB and, more importantly, the role of the Kenyan government within grain markets.

3.3.5. Lessons: the intricacies of infrastructure investments to promote untapped production capacity and develop inclusive local and regional value chains

There have been substantial changes to the functioning of the Kenyan maize value chain in recent years. A central feature of this has been the greater reliance on non-governmental actors, of which the EAGC warehousing system is a central example. The availability of high-quality certified warehouses associated with training and other services such as the WRS has the potential to provide an important service to mitigate risks, reduce post-harvest losses and ensure farmers receive more competitive prices. As such, it provides a key aspect of trade-related infrastructure that can benefit smallholders. These demonstrate the importance of combining hard infrastructure with services to make value chain creation more inclusive and to maximise linkages to domestic economies (OECD, 2011). Further, a functional EAC-wide WRS could also function as a precursor for a regional commodity exchange (see Section 2.4).

The EAGC system has attempted to specifically integrate smallholder farmers into the WRS, with substantial increases in participation seen year on year. However, the number of farmers participating in the system is still only in the several thousand. The new WRS, and particularly the complex political process accompanying these reforms, holds great potential for a more inclusive and transparent value chain for smallholders that, moreover, allows for greater value capture. However, this entails many uncertainties – at this stage accessibility for smaller farmers remains limited and primarily traders and larger producers are benefiting in the absence of increased financing, as well as the improved ability of farmers to either deposit smaller amounts or aggregate at the local level. Furthermore, trust is central here: the dual system of warehouses with highly different outcomes highlights that trust and a legitimised certification process is central to address market failures and facilitate other benefits from a functional warehousing system beyond the financial gains from time arbitrage enabled through storage, including improved quality and reduced post-harvest losses. Finally, the substantial levels of state intervention in maize price management complicate the levels of trust required for banks and warehouse operators to engage in the system.

3.4. Conclusions and policy implications

The literature reviewed in this cluster suggests participation in GVCs can lead to higher value addition in exports, while creating opportunities for SMEs to upgrade production and increase productivity through foreign involvement and learning-by-exporting. However, SMEs typically face a range of challenges in integrating into

³² Further concerns raised by private sector actors related to the identity of the regulator (i.e. whether this should be the parastatal linked to the NCPB or whether this should be left to a non-governmental entity). Disputes also revolved around whether the exchange should be broadened to other, non-agricultural, commodities.

GVCs. In Sub-Saharan Africa, these challenges are exacerbated by the region's relative marginalisation from global production networks.

From a policy perspective, improvements to infrastructure and trade facilitation can help bridge the gap and enable African countries to better connect to GVCs. There is already widespread recognition of the urgent need to improve infrastructure in Sub-Saharan Africa, and this has only gained importance in the era of GVCs. We have shown in this chapter that there is a clear positive association between improvements along both of these dimensions and value chain connectivity. One way African countries can generate the necessary improvements in these areas is through the implementation of the WTO Agreement on Trade Facilitation.

Regional dimensions are also important for value chain connectivity. The results from our research point to a strong positive association between infrastructure and trade facilitation improvements in neighbouring countries, and greater value chain connectivity at home. The evidence provides compelling support for a regional approach to infrastructure development.

In this respect, the growing emphasis in parts of Africa on a corridor approach to infrastructure development seems to be well placed. This can play an important role in generating cross-border spillovers and facilitating the integration of economic units that are spread across political borders. This should be supported by the development of good gateway infrastructure and strong connections to the hinterland, both of which are particularly important for landlocked countries to successfully integrate into GVCs. African policymakers, as well as donors and multilateral agencies, need to redouble their efforts in this area, including in the context of AfT.

Our research in this cluster has also emphasised the importance of complementarity among different types of hard infrastructure (roads and warehouses) but also between hard and soft infrastructure for unlocking coordination failure in the development of inclusive local and regional value chains. One specific example of the potentially positive effects of this sort of complementarity can be found in the case study we present of warehouses in Kenya. The case study shows that investments in key value chain infrastructure such as warehouses and related services have great potential to develop national and regional value chains. However, this requires appropriate policy support, particularly to make these value chains inclusive. In the case of warehouses, policy interventions are required to address coordination failures. In this respect, complementary regulation and policies – such as the introduction of a WRS, developing PPP relationships and creating collateral through quality infrastructure and extension services – can be introduced to overcome specific market.

More generally, the combination of hard and soft infrastructure is important for enabling domestic producers, particularly small-scale producers, to overcome market access constraints and ensure they are able to participate in both domestic and regional markets. This often requires a regional approach to facilitate complementarities between countries.

The combination of hard infrastructure and services can facilitate the creation of more inclusive value chains that maximise linkages to domestic economies. High-quality, accessible and efficient trade logistics services, for instance, are crucial to the effective functioning of value chains (this is discussed further in Chapter 4). In some cases, efficient trade logistics services can also play a supporting role in facilitating the effective pass-through of the benefits of regional integration to small producers, by enabling them to benefit from higher mark-ups and product prices and better access high-quality inputs for production.

Finally, these initiatives can be supported by the development of regional standards, albeit set at an appropriate level of stringency. Setting of standards to an appropriate level of stringency will require both consultation and assessment of the constraints and needs from both the supply and the demand side throughout the value chain.

4. Regional infrastructure for trade facilitation and the productivity of firms

This chapter examines the link between RITF and firm-level productivity. We first discuss the impacts of regional trade and regional infrastructure on firm productivity, drawing on the empirical evidence presented in the background paper by te Velde (2015); and explore some dimensions of the link between RITF and firm productivity in greater detail, using the example of the disaggregation of costs of imports for Bhutan, India and Nepal as identified by De (2015). We then discuss the policy dimensions of these empirical findings, focusing on the role of soft infrastructure as a crucial complement to hard infrastructure (Section 4.2). This includes a focus on the efficiency of regional logistics services and the role of localisation barriers and transit agreements. Section 4.3 concludes with a series of regional policy options designed to unlock the trade-inducing benefits of improvements in regional infrastructure.

Box 6 summarises the key findings presented in this chapter.

Box 6: Key findings on RITF and the productivity of firms

This chapter examines the link between RITF and firm-level productivity. The empirical analysis based on firm-level panel data (in Rwanda, Malawi, Senegal and South Africa) presents new evidence that regional infrastructure is important for firm productivity. The empirical results show regional exporters not only have higher productivity than other firms but also experience greater productivity growth (reflected in faster growth in labour productivity in both Malawi and Rwanda and more rapid total factor productivity (TFP) growth in Senegal).

The average productivity gap between regional exporters and other firms ranges from 18% in Malawi to 60% in Senegal and 72% in Rwanda. This is due, in part, to greater emphasis on technology, which has led to higher productivity and better product quality.

Further evidence shows the productivity-enhancing effects of regional infrastructure do not come only from the exporting side – the overall effects on firm-level productivity can work through both exporting and importing. Firms in countries with better regional infrastructure (reflected in the quality of infrastructure in their neighbours) also have relatively higher productivity. We also find the impact of regional infrastructure is greater for firms that import some material inputs and supplies compared with those that do not.

The key implication of the findings in Section 4.1 is that investments in regional infrastructure have long-lasting effects on firm productivity. This is a significant result in terms of the link in the theory of change running from regional infrastructure to sustained poverty reduction.

4.1. Regional infrastructure and firm-level productivity

There are at least two important steps in the longer impact chain from regional infrastructure to poverty reduction. First, we examine whether regional trade (exports in particular) has a long-lasting effect on productivity, which is a crucial link in the theory of change running from regional infrastructure to sustained poverty reduction (see

Section 4.1.1). If regional exporters are indeed better performers and this is sustained over time, policy that facilitates regional trade can have long-lasting impacts in addition to the short-run gains from trade. Second, we examine the wider impact of regional infrastructure on firm-level productivity directly, encompassing the effects through (regional) exporting as well as importing (Section 4.1.2). Having established the relevance of regional infrastructure, we also examine the differential experience of firms with respect to regional infrastructure, by discussing firm-specific costs of clearing borders (Section 4.1.3).

4.1.1. Regional exporting and productivity

Infrastructure can enhance trade and value chain participation, and regional infrastructure can raise the opportunities to export regionally. How would this affect firm productivity? Chapter 3 has already discussed the importance of exporting for productivity. Exporting and foreign ownership lead firms to be exposed to greater competition, and this involves higher aggregate productivity (Syverson, 2011). There are, however, questions on the pathways and direction of these correlations. The recent debate on trade and growth at the level of the firm not only suggests that the most productive firms within an industry export but also that such firms are likely to have been the most productive firms within an industry *before* exporting – that is, exporters self-select into markets. However, at the same time, the results of firm-level studies also suggest productivity typically increases after entering the market – that is, ‘learning-by-exporting.’

Van Biesebroeck (2005) finds for a panel of manufacturing firms in nine African countries (data from the World Bank Regional Programme on Enterprise Development collected in the early 1990s) that on average exporters in these countries are more productive and raise their productivity advantage after entry into the export market. The effects occur through scale effects and are robust to including self-selection and other unobserved differences in productivity.

There are far fewer studies examining the link between firm-level productivity and exporting at the *regional* level, with the exception of te Velde (2011) for Benin, Malawi and South Africa and Mengistae and Pattillo (2002) for Ethiopia, Ghana and Kenya. Unfortunately, none of these studies tested directly for dynamic effects over time such as on learning-by-exporting.

The background paper by te Velde (2015) provides new evidence on the impact of regional exporting. In broad terms, the evidence from firm-level panel data (in Rwanda, Malawi, Senegal and South Africa) suggests not only that regional exporters have higher productivity than other firms but also that they have greater productivity growth. This works in part through the increased emphasis and impact of technology. This means it is important to facilitate regional trade because of the long-lasting impact on productivity.

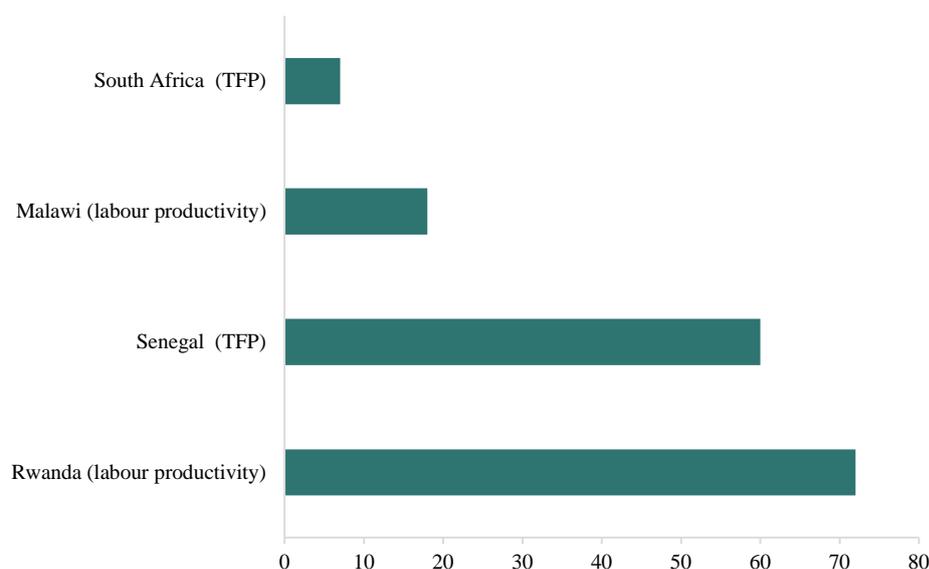
More specifically at the country level, firm-level analysis for **Rwanda** shows regional exporters have a higher level and faster growth in labour productivity growth over 2006-2011. The average productivity gap is 72%, slightly below the gap for all exporters. The panel data show regional exporters are more likely to innovate and survive (compared with other firms).

In **Malawi**, regional exporters have a higher level and faster growth in labour productivity growth over 2005-2009. The productivity gap between regional exporters and other firms is 18%.

In **Senegal**, regional exporters have a 60% higher level of TFP (but this varies by sector and firm size group), with the TFP growth over 2003-2007 70% compared with 40% for the control group. Regional exporters have a higher growth in TFP partly because the impact of technology has led to higher productivity and better product quality. The average cost of border crossing is similar across crossings (land, or air and sea), but there is wide variability for each type of crossing between 0% and 50% of consignment value. The more productive firms export over land.

In **South Africa**, using WBES panel data for 2003 and 2007, we show growth in TFP has been much greater in regional exporters compared with other firms (non-exporters), leading to a productivity pay-off of some 7% in 2007.

Figure 17: Productivity (TFP or labour) mark-up for regional exporters (%)



Note: Estimates for latest year available.

Source: Te Velde (2015).

4.1.2. Regional infrastructure and firm-level productivity

The productivity effects through regional integration and regional infrastructure do not need to come only from the exporting side. For example, De Hoyos and Iacovone (2013) analyse the impact of the North American Free Trade Agreement (NAFTA) on the productivity of Mexican plants, allowing for heterogeneous productivity effects between firms with varying levels of integration – that is, firms integrated through exports or imports or through both exports of final products and imports of raw materials (fully integrated firms). The results show NAFTA stimulated an increase in productivity through import competition and access to imported intermediate goods but a weaker relationship between exports and productivity growth. A possible explanation for the lack of evident improvements in the productivity growth of exporters, as opposed to importers, could be that the extra market access for Mexican exporters after NAFTA has been modest given US tariffs were already low.

The background paper by te Velde (2015) explores the overall effects of regional infrastructure on firm-level productivity that can work through exporting and importing. One question in the WBES data asks: were any of the material inputs and supplies imported directly? We would expect firms that are linked into global networks to be able to source the best quality inputs and hence improve production quality. Such firms would also be able to learn from their suppliers, increasing productivity through importing. These effects will be multiplied with good-quality infrastructure: the impact of regional infrastructure on productivity should be higher when firms import inputs and supplies.

The background study created country- and time-varying measures of the quality of regional infrastructure, and trade- and transport-related infrastructure specifically, and linked this to firm-level productivity. In line with Cadot et al. (2015) and Shepherd (2015), it constructed indicators of regional infrastructure for African countries by taking the average of the LPI of all neighbouring countries (excluding island states).

The LPI 2014 ranks 160 countries on six dimensions of trade logistics:

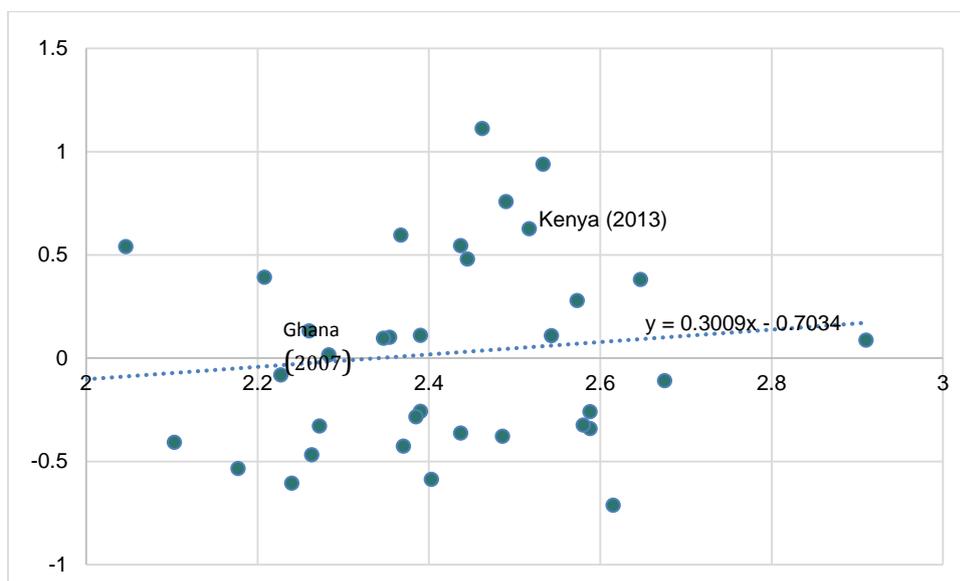
- Efficiency of customs and border management clearance ('Customs');
- Quality of trade and transport infrastructure ('Infrastructure');
- Ease of arranging competitively priced shipments ('Ease of arranging shipments');
- Competence and quality of logistics services – trucking, forwarding and customs brokerage ('Quality of logistics services');
- Ability to track and trace consignments ('Tracking and tracing');

- Frequency with which shipments reach consignees within scheduled or expected delivery times ('Timeliness').

The LPI uses standard statistical techniques to aggregate the data into a single indicator that can be used for cross-country comparisons.³³ We use the aggregate index, as well as the specific index on the quality of trade and transport infrastructure. We use the variation over time and across countries to examine whether firms in countries that have seen improvements in regional infrastructure have also seen greater productivity.

Figure 18 compares the average value of the index for countries in specific years with average productivity levels. It suggests there is a positive relationship, meaning that, when countries have good regional infrastructure, their firms have relatively higher productivity. For example, if the regional infrastructure measure increases by one standard deviation (e.g. from Ghana to Kenya), productivity would increase by 6% ($0.19 * 0.30$).

Figure 18: Regional infrastructure score (horizontal) is associated with higher average productivity level at country level (vertical level)



Source: Own calculations.

We then estimated a number of relationships between the new regional measure and firm-level productivity in African countries, controlling for other determinants such as foreign ownership, firm size, exporting status, etc. We find that countries with better regional infrastructure (quality of infrastructure in the neighbours) also have firms with relatively higher productivity. If the regional infrastructure measure increases by one standard deviation (e.g. from Ghana to Kenya), productivity would increase by 7% for changes in the overall infrastructure measure and 19% for changes in the trade-related measure. This effect is robust to including country dummies and other explanatory variables. As expected, we also find that the impact of regional infrastructure is greater for firms that import some material inputs and supplies compared with those that do not.

4.1.3. Clearing costs vary across firms as well as border crossings

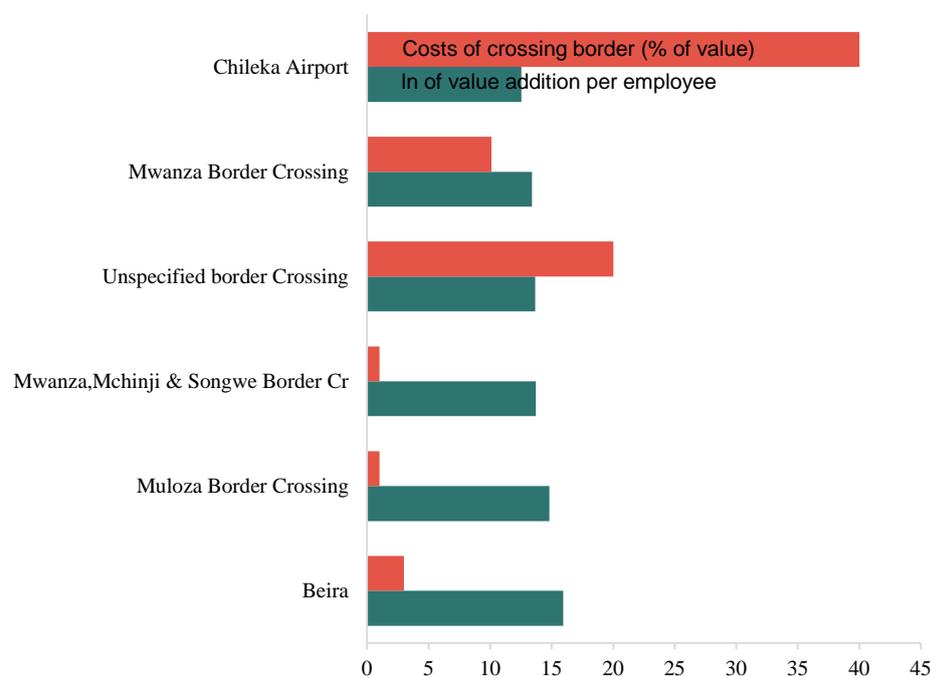
Clearly, it is important to invest in regional infrastructure as this supports productivity levels, through facilitating exporting and importing. Such investment should cover more than hard infrastructure alone given that we find different exporters that use the same infrastructure at the same gateway face different clearing costs.

Clearing costs can vary markedly between border crossings (e.g. between 1% and 40% of consignment value in Malawi), but the costs vary across not only border crossing but also types of exporters using the same crossing.

³³ See <http://lpi.worldbank.org/> for further information

Figure 19 compares labour productivity levels with cross-border costs. The data suggest more productive firms export through lower-cost border crossings. The least productive firms face the highest costs in crossing borders.

Figure 19: Comparing costs of crossing border to labour productivity



Source: Own calculations based on WBES data for Malawi.

The difference in average clearing costs between types of gateway (land, airport or sea) reported by South African firms is the same ($8.5 - 5.8 = 2.8\%$) as the difference in clearing costs between regional exporters and global exporters for using these gateways ($9.4 - 7.6 = 2.8\%$) (see Table 3).

Table 3: Clearing costs at border crossings in 2007 (% of consignment values)

	Global exporters	Regional exporters	All exporters
Land	5.8 (7)	8.5 (51)	8.2
Airport	4.6 (8)	8.7 (9)	6.8
Sea	8.5 (51)	11.3 (32)	9.6
All	7.6	9.4	8.7

In Senegal, the variation between average clearing costs border crossings is smaller than that among firms using the same gateway. There are two main routes: Dakar via airport or sea and Rosso/Casamance via land in the north/south. The clearing costs vary substantially between close to zero and 50% of consignment value for Dakar and between 4% and 30% for the other routes. However, the average clearing cost is 14% for regional exporters for both types of crossing and 18% for all exporters via Dakar and 14% via land. Interestingly, exporters have higher productivity going over land compared with sea or air: the gap is 50% for regional exporters and 27% for all exporters.

In policy terms, this means it is important to reduce the variation in clearing costs across firms using the same gateway in addition to reducing the average clearing costs of different gateways. Much of this is likely to involve soft regional infrastructure.

The background study by De (2015) on Bhutan, India and Nepal as explained in Box 7 argues that many of the costs faced by firms in the importing process differ depending on the country of origin of the importing firm and on the destination of the imported product. These include, in some instances, variation in the costs faced by different importing firms using the same regional infrastructure facilities (in this case the gateway ports in India).

This further suggests it is not just the quality of regional hard infrastructure such as roads and ports that influences trade costs and firm productivity, but that other factors are present that impact on the transaction costs of trade, the capacity of firms to trade and, ultimately, their productivity.

Box 7: Disentangling transit costs and time in South Asia – Lessons from firms in Bhutan and Nepal importing through Kolkata and Haldia ports

Focusing on Bhutan, India and Nepal, the background paper by De (2015) indicates that costs associated with the importation and transit of goods can vary significantly across firms and countries. As landlocked least-developed countries in South Asia, Bhutan and Nepal face many challenges in exporting to, and importing from, overseas markets. For instance, imported goods from overseas markets must enter the gateway ports of Haldia and Kolkata, located on the east coast of India, before being transported to their final destinations in Bhutan or Nepal. This geographical disadvantage is exacerbated by a lack of effective transit options.

De's analysis focuses on the trade costs associated with two transport corridors (Kathmandu to Kolkata and Thimpu to Kolkata) and two border crossings (Raxual–Birgunj and Jaigaon–Phuntsholing) that connect Nepal and Bhutan with the gateway ports. In order to quantify these costs, a field survey of 50 importing firms that utilise Kolkata and Haldia ports and the Nepal and Bhutan transport corridors was conducted.

The survey data indicate the costs incurred at the gateway ports and in transit vary significantly depending on whether the imported product is destined for Bhutan or Nepal. The overall cost of importing a container load of goods is approximately \$1,174 per 20-foot equivalent unit (TEU) in the case of Nepal and \$1,216 per TEU for Bhutan. A disaggregation of the overall costs (see Table) indicates the specific costs associated with getting a product through the gateway ports in India vary depending on whether the product is destined for Bhutan and Nepal. This is despite the fact importers in these two countries utilise the same port infrastructure as an entry point for products sourced from overseas markets.

Disaggregated import costs for Bhutan and Nepal

Bhutan				Nepal			
Sr. no.	Procedures	Cost (US\$)*	Share (%)	Sr. no.	Procedure	Cost (US\$)#	Share (%)
1	Obtain trade licence	78.00	6.41	1	Contact importer/broker	0.15	0.01
2	Registration for import house	0.00	0.00	2	Fix trade term	0.52	0.04
3	Obtain import license/permit	0.00	0.00	3	Sign and exchange contract	7.16	0.61
4	Open L/C account	0.00	0.00	4	L/C opening service charge	39.55	3.37
5	Obtain Letter of Guarantee	0.00	0.00	5	Insurance cost	49.30	4.20
6	Arrange transport	45.46	3.74	6	Obtain DFTQC approval	0.00	0.00
7	Handling charges at Kolkata/Haldia port	358.87	29.51	7	Collect and prepare required document	7.24	0.62
8	Clear goods at Changrabanda	33.33	2.74	8	Hand over document to clearing agent by courier	6.60	0.56
9	Transport goods to Jaigaon/Phuentsholing	577.42	47.49	9	Handling charge at Kolkata/Haldia port	138.71	11.82
10	Complete import documentation	11.25	0.93	10	Custom clearing cost at transit custom	14.50	1.24
11	Cargo transfer	12.56	1.03	11	Warehouse charge at Kolkata/Haldia	24.87	2.12
12	Custom service charge	4.52	0.37	12	Freight from Kolkata to factory in Nepal	707.27	60.26
13	Payment at India/Bhutan border	30.21	2.48	13	Cargo transfer	28.78	2.45
14	Payment to CHA	23.40	1.92	14	Custom service charge	30.45	2.59
15	Obtain import declaration	40.91	3.36	15	Clearing cost to CHA at importer's custom	6.09	0.52
	Total	1215.93	100.00		Other (including informal costs)	112.56	9.59
					Total (import process costs in Nepal)	1173.75	100.00

Note: * Per TEU.

In both cases, cargo handling charges at the gateway ports account for relatively large shares of the total import cost (29.5% for Bhutan and 11.8% for Nepal). There are clear differences in the average value of these costs per TEU for Bhutan and Nepal, with the handling charge at Haldia/Kolkata port markedly higher for imports destined for Bhutan (\$358.87) compared with imports headed to Nepal (\$138.71). Other directly comparable charges also vary substantially depending on the destination of the imported product and the borders crossed. For example, while importers in Nepal incur an average service charge of \$39.55 per TEU to open a letter of credit (L/C) account, there is no charge for importers in Bhutan. On average, customs service charges and cargo transfer fees are also notably lower for Bhutan's imports: the customs service charge per TEU is \$4.52 for Bhutan versus \$30.45 for Nepal, while the cargo transfer fee applied to Bhutan's imports is \$12.56 compared with \$28.78 for Nepal. Moreover, the disaggregation of costs incurred in importing in the table above also suggests that not only is there variation in the magnitude of costs incurred by importers in Nepal and Bhutan for similar services but also these importers face different types of charges when importing a similar product through either of the two gateway ports.

The main point is many of the costs firms face in the importing process differ depending on the country of origin of the importing firm and the destination of the imported product. These include, in some instances, variations in the costs faced by different importing firms using the same regional infrastructure facilities (in this case the gateway ports in India). This suggests it is not just the quality of regional hard infrastructure such as roads and ports that influences trade costs and firm productivity: other factors are present that impact on the transaction costs of trade, the capacity of firms to trade and, ultimately, their productivity.

One key factor is soft infrastructure. Importing firms in both Bhutan and Nepal cite costly cargo handling charges, a lack of appropriate cargo handling equipment to load and unload cargo more rapidly, a lack of trained human resources, the absence of electronic vehicle tracking systems, slow turnaround of vessels and the prevalence of time-consuming manual examinations of goods among the key issues affecting the efficiency of transit and other trade-related services at Haldia and Kolkata ports. These issues manifest in lengthy times for cargo destined for Bhutan or Nepal to clear Kolkata or Haldia ports. It takes an average of 135.6 hours (5.65 days) for cargo destined for Nepal and 156.1 hours (6.50 days) for cargo en route to Bhutan to clear the ports.

Moreover, some of the variation in importing costs faced by firms in Bhutan and Nepal is likely to stem from differences in the efficiency and cost of particular trade logistics services available at the ports and border crossings and along transit routes. For instance, documentation requirements and import procedures differ for firms importing to Bhutan, India and Nepal. An importer in Nepal is required to submit 22 documents when importing through the ports of Haldia or Kolkata, while an importer in Bhutan submits 16 documents for the same purpose, of which three are exclusively required for the handling of goods at the gateway ports. On average, firms in Nepal are required to complete 20 major import procedures, of which five are necessary to fulfil the requirements imposed by the transit country (India) and 15 by the importing country itself (Nepal). In comparison, 17 import procedures are required for Bhutan and 14 for India.

Transaction times at gateway ports and border crossings and in transit along the key corridors also vary and are notably longer for Nepal in comparison with Bhutan. This is the product of significantly longer transit times between Kolkata or Haldia ports and the border (Raxual and Birgunj), more time spent at the border (in terms of idle time, time spent loading and unloading goods, customs clearance times and idle time spent inside the port) and length of time taken to transport goods from the land border to the warehouse. As one example of variation in the efficiency of customs clearance services between different border crossings, the survey data indicate it takes on average 25 hours to clear imported cargo through the India–Nepal land border, compared with approximately an hour to clear goods through Bhutan's customs authorities

4.2. Drivers of the efficiency of regional trade logistics services for productivity enhancements

While improving the quality and availability of physical infrastructure such as roads, railways and ports is undoubtedly critical to effectively facilitate cross-border trade, the analysis in Section 4.1 suggests improvements to the soft components of infrastructure can be equally important. The latter include less tangible elements such

as information and communications technology (ICT), institutional effectiveness, customs management, transport services and quality of the business environment. These factors have a critical impact on the efficiency of trade logistics services and, ultimately, on the ease with which goods and services flow across countries and regions.

The efficiency of logistics services is a key, but often underemphasised, aspect of international trade. Services such as freight transportation, warehousing, border clearance and payment facilitation play a crucial role in facilitating the flow of goods and productive activities across borders and between the various levels of international supply chains.

In this context, the quality of infrastructure and logistics services has been shown to be an important determinant of trade performance (Clark et al., 2004; Limao and Venables, 2001). At an aggregate level, Wilson et al. (2005) show factors such as greater port efficiency, better regulatory environments and improved services sector infrastructure in both importing and exporting countries, and the customs environment in importing countries, are positively associated with trade. Improvements to the efficiency of trade logistics services can boost trade by reducing the financial costs and time associated with trade, lowering the level of variability in trade costs and ensuring more reliable delivery of traded goods to their intended destinations (Brooks, 2008). For example, looking at five Asian countries, Carruthers and Bajpai (2002) estimate that a 20% reduction in logistics costs in Cambodia, Laos, China, Mongolia and Papua New Guinea would boost the trade to GDP ratios in these countries by between 10% and 20%.

At the same time, inefficiencies in trade logistics services have the opposite effects. Such inefficiencies raise the costs associated with trade and hinder opportunities for regional and global integration (Arvis et al., 2014). The former may occur when poor-quality logistics services raise the value of direct monetary outlays associated with trading; increase the time taken to trade; intensify the risk of damaged cargo, resulting either in losses or higher insurance costs; or simply mean access to vital logistics services is unavailable to traders (Nordås and Piermartini, 2004). Many of these factors are at play in Africa. The quality and efficiency of transport logistics services on the continent tends to be hampered by low levels of competition between transport service providers (Jordan, 2013; Ondiege et al., 2013), which is often simply due to the limited number of service providers operating in the region, outdated trucks and poor quality roads (Pedersen, 2001) and poor governance and rent-seeking at border crossings, roadblocks and customs facilities (Arvis et al., 2007), all of which lead to transit delays and contribute to the comparatively high cost of transport in the region.

Through reductions in trade costs that facilitate increases in the variety and volume of trade flows both regionally and globally, improvements to the quality and efficiency of trade logistics services can have both direct and indirect impacts on poverty and growth. At the household level, increases in the variety and volume of trade flows can raise consumer welfare and increase resilience and food security, thereby impacting directly on poverty alleviation efforts. At the firm level, investments in regional hard and soft infrastructure that influence the efficiency of trade logistics services are likely to boost levels of competition in particular markets, in turn directly impacting growth through firm sales. They may also boost growth indirectly by facilitating access to better-quality or cheaper inputs into production, improving firm-level productivity or facilitating the development of cross-border value chains. Finally, the boost to trade flows that stems from improvements to the efficiency of trade logistics services can impact directly on poverty and growth by raising government tax revenues through taxes on imports or the development of formal economic activity.

These channels of impact highlight the importance of identifying and removing specific barriers to the effective functioning of regional hard and soft infrastructure that undermine trade logistics services. With this in mind, Section 4.2.1 reviews relevant literature in order to identify the types of barriers that affect the quality and efficiency of trade logistics, reduce competition in logistics services sectors and raise trade costs in the manner described above. This is complemented by the table in Annex 1, which provides illustrative examples in order to highlight the impact these various types of barriers have on trade performance and the ability of providers of trade logistics services to operate in specific contexts. Section 4.2.2 reviews the theoretical literature in order to highlight the channels through which these barriers impact firms and their productivity. Section 4.2.3 discusses the importance of transit agreements in supporting efficiencies in the regional dimension of trade logistic services. Finally, Section 4.3 concludes with a series of regional policy options designed to unlock the trade-inducing benefits of improvements in regional infrastructure.

4.2.1. Identifying regulatory barriers to efficiency of trade logistics services

Drawing on the Kunaka et al. (2013) categorisation and gathering evidence from the literature as well as from the background case study looking at transit between India, Bhutan and Nepal (see Box 7), Annex 1 presents a detailed outline of different types of barriers that affect the efficiency of trade logistics, reduce competition in logistics services sectors and raise trade costs. These are organised into broad categories as follows: (i) *Market access constraints, discriminatory regulations and limits on the scope of activity in the logistics sector* (transport and freight services, licensing and service restrictions, ownership and investment, labour market restrictions, local content requirements); (ii) *Barriers to accessing and using the infrastructure necessary to provide logistics services* (hard infrastructure); and (iii) *Issues associated with the management of trade* (customs and border management, insurance). Annex 1 also presents illustrative examples of each type of barrier in specific countries and contexts.

Many of the barriers listed in Annex 1 arise as a result of regulations that hamper – intentionally or not – the extent to which certain types of providers are able to access markets for trade logistics services. The licensing and service restrictions, for example, include barriers such as limits on the number of operating licences granted in specific logistics industries, or regulations that prohibit certain types of firms from obtaining the necessary licences to operate, which restrict the number and nature of firms permitted to provide logistics services in particular markets. Some of these regulations also influence the manner in which service providers operate in specific markets. For instance, restrictions on the employment of foreign labour in certain logistics industries mean firms must hire local residents or limit the share of foreigners in their workforces. Alternatively, restrictions on access to certain infrastructure facilities – such as requirements to utilise only local facilities and infrastructure or the presence of onerous compliance conditions in order to use particular infrastructure services – can raise the cost of performing logistics services by forcing firms to invest in their own facilities or seek out alternative routes and locations in which to operate.

A few of the restrictions and regulations in Annex 1 are non-discriminatory in nature, meaning they are applied equally to local and foreign logistics service providers (such as restrictions on hours of operation for transportation services, onerous customs documentation requirements, limitations on the use of customs brokers or lack of coordination in administrative procedures at border crossings). However, the majority of these regulations represent localisation barriers that favour domestic logistics firms over their foreign counterparts (Biljanoska and Trajkov, 2011; Hollweg and Wong, 2009; Stone et al., 2015). This includes cabotage restrictions, cargo reservation schemes and third country rules, which limit the extent to which foreign transport and freight service providers can operate in local markets. The operations of foreign firms in a particular country may also be limited by ownership and investment regulations, such as joint venture requirements that permit market access only to foreign firms that enter into a joint venture with a domestic operator or legislation that prohibits foreign firms from investing locally. In some instances, financial incentives and preferences – such as land grants, low interest rates, subsidies and tax incentives – are offered to domestically owned logistics service providers but not their foreign competitors.

Importantly, many of the abovementioned factors may not be designed to intentionally act as barriers to trade. This is in contrast with local content requirements, which are explicitly designed to force foreign firms to localise economic activity and promote domestic industries – for example by requiring that a specified percentage of locally produced inputs be included in the production of final goods in order to enter particular markets. Stone et al. (2015) show local content requirements raise domestic production costs. This has broader implications for the competitiveness of economies in which they are applied. Specifically, higher production costs resulting from local content requirements raise output prices, which, in turn, increase costs for downstream producers. The result is reduced competitiveness across industries and the economy as a whole (ibid.).

While the barriers listed in Annex 1 are not local content barriers *per se*, they have similar effects in that they limit the level of competition in the trade logistics services sector or lead to higher operating costs for logistics service providers. These effects ultimately translate into higher prices for those consuming these services (Fink et al., 2000). Curtailing competition in certain logistics industries generates market power among the incumbents and can lead to collusion and exploitation, without necessarily any accompanying improvements to services or efficiency (Teravaninthorn and Raballand, 2009). In fact, the result is likely to be reduced market efficiency and is equivalent to a tax on production (Hollweg and Wong, 2009; Kunaka et al., 2013).

The opposite is likely to be true in more contested markets (Hummels et al., 2009). Competition in the logistics sector can play an important conditioning role in improving the quality and efficiency of certain types of logistics services. In the case of transportation services, for instance, higher levels of competition between operators can lead to lower transport tariffs and the provision of better quality transport (Raballand et al., 2008). This is especially relevant for landlocked countries.

4.2.2. The impact of inefficiencies in trade logistics services for firm-level trade and productivity

The analysis above highlights a range of potential regulatory barriers that can affect the availability and quality of trade logistics services. The inefficiencies generated by these barriers affect the capacity of firms to export and influence their ability to source important intermediate inputs, which has implications for firm productivity. We examine the evidence in this section.

Trade logistics services and firm-level trade

Poor-quality or inefficient trade logistics services affect the capacity of firms to import intermediate inputs. Such inefficiencies may force firms to maintain large inbound inventories, potentially inflating storage costs (Gonzalez et al., 2008; Martincus et al., 2014; Nordås et al., 2006). They may also mean firms have to utilise inferior quality, or more expensive, domestic inputs. In extreme cases where the required inputs are unavailable, they may even compel firms to alter their product mixes or cease production altogether.

Inefficiencies in the logistics sector that cause delays or raise transport costs affect the capacity of firms to export. Using a novel transaction-level dataset on exports from Uruguay covering the period from 2002 to 2011, Martincus et al. (2015) estimate a 10% increase in customs delays results in a 3.8% decline in exports. These delays affect the quantities shipped by exporting firms, the number of buyers for firms' products in export markets and the average value and quantity of exports per buyer. Martincus et al. (2014) estimate a 1% increase in transport costs has the effect of reducing exports by as much as 6.5%. Hornok and Koren (2015) show exporting firms respond to higher per-shipment transport costs by reducing the frequency with which they ship their products.

These impacts are, however, likely to be heterogeneous across different types of products and firms. They are likely to be heightened in the case of time-sensitive products that are subject to rapid deterioration or frequent changes in market trends (Martincus et al., 2015). For example, fresh produce is at risk of spoilage, clothing and footwear are subject to changes in fashion cycles and firms producing consumer electronics face the prospect of technological obsolescence if inefficiencies in trade logistics services result in lengthy delays in the transit of these products between locations (Hummels, 2007).

Trade in non-perishable products may also be sensitive to the speed of logistics services. For example, trade in parts and components, a crucial element of networked production across countries, relies heavily on high-quality logistics services that are both speedy and reliable. In one example, Kunaka et al. (2013: 9) explain that 'a Japanese electronics manufacturer with a plant in Thailand wanted to utilize a component supplier in Cambodia but found the transshipment of cargo at the border both costly and posing a risk of damage to the components. The firm therefore sought a special dispensation from the authorities to operate trucks through the border to link the two plants.' The implication is that it is not just the cost of logistics services but also their efficiency that is important for international production networks to function as intended.

The impact of inefficiencies in trade logistics services on exporting firms may also differ with variation in market characteristics. For instance, Martincus et al. (2015) argue lengthier delays in moving goods through customs will be felt more heavily in more competitive markets or those that are more distant or difficult to reach for the exporting firm.

Trade logistics services and firm productivity

By itself, such access is likely to increase firm's productivity. In addition, the discussion in the introductory section argued that improvements to the efficiency of trade logistics services can reduce both the financial and the time costs associated with trade. Improvements along these two dimensions have important implications for firm productivity. Specifically, the lower trade costs associated with more efficient trade logistics services can generate higher levels of firm productivity through two main channels. First, lower trade costs raise competition by

boosting the number and range of products and services available in individual markets. The increased competition induces firms to improve their productive efficiency (Lawrence, 2000). Moreover, in the face of heightened competitive pressures, the less efficient firms may be forced to exit, thereby raising aggregate productivity at the industry level through inter-firm reallocations towards more productive firms (Melitz, 2003).

Second, lower trade costs may induce intra-firm reallocations whereby firms change their product mixes (Bernard et al., 2005a, 2005b). In instances where lower trade costs result from improvements to trade logistics services, importing countries may become more exposed to imports from low-wage countries. This induces changes among firms in the importing country, who respond to the competition from low-wage country imports by upgrading their product mix towards more capital- and skill-intensive products (Bernard et al., 2005b). The production of these products is typically associated with higher levels of productivity.

The ability of firms to integrate into regional and global production networks is determined in large part by the quality and efficiency of trade logistics services. Rapid and low-cost transport services, for example, are a critical element of cost-competitiveness in value chains (*ibid.*). In addition, access to efficient data services and storage facilities and ICT infrastructure can play an important role in enabling firms to link into GVCs and global production networks. The previous section highlighted that poor logistic services reduce access to cheaper and higher-quality inputs and thereby firms' productivity; the effect is even more pervasive in the context of new trade patterns.

In this context, the types of localisation barriers introduced in Annex 1 can have an adverse effect on the ability of firms to integrate into international production networks. Those barriers compromise the ability of firms to access better-quality and more technologically advanced inputs from foreign suppliers or more efficient logistics services from foreign operators (Stone et al., 2015) – both of which represent key elements for successfully upgrading in GVCs. On the basis that foreign imports are expected to embody more advanced technology, the resulting economic isolation has potentially negative implications for firm productivity, given the correlation between trade in intermediate inputs and higher productivity levels (Shepherd and Stone, 2013). Through this channel, localisation barriers potentially undermine the efficiency gains firms stand to benefit from through integration in GVCs.

4.2.3. The regional dimension of trade logistic services: importance of efficient transit agreements and logistics services for landlocked regions and countries

At the regional level, the transit of goods through different countries requires countries to agree on transit agreements regulating a range of procedures, from the clearance of goods at the point of entry to those at the various borders that may be crossed throughout the journey until the point of arrival. Transit agreements, therefore, represent soft infrastructure that regulates the access to, and use of, trade-related hard infrastructure. This subsection examines the specific character of transit agreements and the factors that affect their effectiveness. In doing so, it provides a number of illustrative examples of instances in which soft infrastructure issues affect the effective implementation of transit agreements. This, in turn, has implications for the effectiveness of regional hard infrastructure in facilitating intra-regional trade.

Transit relies on the following key principles (Arvis et al., 2010):

1. Transit is a chain of harmonised national procedures, rather than an international procedure. Harmonisation among national procedures is key to smooth the process.
2. Transit effectively works as a PPP, and requires consensus between public entities (customs) and private operators (transporters and freight forwarders).
3. Transit depends on guarantees provided by operators for covering the potential fiscal loss.
4. Customs need a sound information system to report the flow of transit vehicles; this does not need to be done in real time, but it must allow customs authorities to reconcile inflows and outflows.

In order to effectively ensure smooth transport across countries, transit agreements must successfully tackle all these points. This section discusses how these issues have been addressed by existing transit agreements.

Transit agreements involve a chain of harmonised national procedures, international rules and regional agreements

Transit agreements require a great degree of coordination and harmonisation among all parties involved. The simpler agreements involve only two countries that decide to trade with each other. For example, Pakistan has signed a number of bilateral transit and road transportation agreements with several countries, including Afghanistan, China, Iran and Uzbekistan (Deloitte, 2012).

Transit agreements are often signed and developed within RECs to promote trade among the member countries. For example, the EU and European Free Trade Area (EFTA) (including Switzerland, Iceland and Norway) apply the Community Transit System. In Asia, the Association of South East Asian Nations (ASEAN) applies a system modelled on the European one. In Africa, ECOWAS applies the Interstate Road Transport (ISRT) scheme. In Southern and Eastern Africa, both COMESA and SADC have developed their own transit management schemes.

Other transit agreements are international and do not cover a specific geographic area but membership is open to all countries. The main example of this is the TIR system, which is currently operational in 58 countries.

Transit effectively works as a public–private partnership

An effective transit system requires the cooperation not only of different countries but also of various stakeholders within a single country. It is also required within government (e.g. between revenue authorities and ministries of transport) and between government and the private sector.

The TIR system, initially created to facilitate trade among European countries and now applied in Central and South East Asia, the Middle East and North America, is one example of this. At the global level, the TIR system is administered by the UN Economic Commission for Europe (UNECE) (an international organisation) in conjunction with the International Road Transport Union (IRU) (UNECE, 2013). This PPP is mirrored in each country implementing the TIR, where the national revenue or customs authority selects and works in partnership with a private sector association, usually a road transport association or a chamber of commerce, to administer the system.

Similarly, three bodies regulate the ISRT scheme applied in West Africa: National Facilitation Committees, Cross-Border Corridor Management Committees and a Regional Inter-State Road Transport and Transit Facilitation Committee. All of these bodies are generally led by the public sector but include representatives from the private sector. The ISRT works together with national chambers of commerce, which act as national guarantors of the system (Zerelli et al., 2008). Therefore, the private sector not only is a recipient of the ISRT but also takes an active role by participating in the decision-making process and in the implementation of the scheme.

However, this can raise a set of challenges, as the success of the collaboration with the private sector can make or break the success of a transit agreement. For example, in Southern and Eastern Africa, both COMESA and SADC Transit Management Schemes are not fully operational because of a lack of awareness in both the private and the public sectors (Mputa and Mwakalombe, 2011).

Transit depends on guarantees provided by operators for covering the potential fiscal loss

The presence of guarantees ensures that, in case a cargo is lost in transit, the revenue authorities are compensated for the loss. For instance, the TIR system provides insurance for payment of taxes and duties in case a container goes missing during transit. If a container travelling from country A to country C through country B is lost in country B, revenue authorities of country B will demand payment of custom duties.

Under the TIR system, the national guaranteeing association of country B ensures duties and taxes are paid, and it is then reimbursed by the IRU. The IRU is, in turn, reimbursed by its global insurer, which then demands payment from the national insurer.

In the COMESA transit scheme, the Regional Customs Transit Guarantee (RCTG) and national sureties³⁴ (financial institutions such as banks and insurance companies) act as guarantors, which means they are authorised by the competent national body to issue bonds and guarantees (Mpata and Mwakalombe, 2011).

Customs need a sound information system to report the flow of transit vehicles

The transit system in place should allow for a clear attribution of customs duties. While this does not need to be dealt with in real time, there needs to be a possibility of tracking whether or not cargo has left the country in which it is transiting.

Under the TIR system, for example, custom officers record the passage of the cargo at borders and input this information in the system (UNECE, 2013). In this way, authorities are always aware of the last border crossed by a specific cargo and, therefore, know which country it is in.

The EAC has recently introduced the Electronic Cargo Tracking System, which allows real-time tracking of the cargo. However, each country seems to have implemented its own tracking system, which may raise issues of compatibility.

Non-exclusivity of transit agreement

It is important to emphasise that it is possible for a country to have multiple types of transit agreements and that they are not exclusive, in the sense that it is not because a country signs a transit agreement that all transited goods have to use it.

For instance, traders can choose under which system they want their cargo to transit through the gateway country(ies). A trader might decide to move goods to country A through country B under a specific system because this system is the more efficient or reliable for the type of goods traded. The decision to use one system over another will depend on price and quality of logistics services, safety, value and nature of the cargo, etc. The trader then uses the services of an agent or freight forwarder who is accredited to operate under that system.

The partial implementation of transit schemes is not always linked to individual choices, but sometimes depends on other issues, such as challenges in the implementation processes or lack of awareness around the schemes. For instance, the COMESA RCTG transit scheme is not widely implemented as its preparation was not adequately consultative and the system failed to gather policy support and buy-in from the private sector (Mpata and Mwakalombe, 2011).

One country can also have different agreement with different countries and therefore the transit system in use will depend on the countries involved. Traders can choose which one to choose depending on the context. For example, EU member states can use the Community Transit System as well as the TIR for within-EU trade but will use the TIR system with non-EU countries.

Key challenges affecting transit agreements

Many transit agreements face a number of challenges during their implementation. As a result, the failure of transit agreements is often due to failures of implementation rather than being a product of shortcomings in the agreements themselves. These usually concern discrepancies between local legislation and the transit agreement or lack of buy-in from the government or private sector. Table 4 summarises some of the examples found in the literature. Most of these issues have to do with the soft infrastructure side, as they are linked to policies and regulations that should be looked at to improve transit.

³⁴ A person who takes responsibility for another's performance of an undertaking, for example their appearing in court or paying a debt.

Table 4: Illustrative examples of issues affecting regional transit agreements

Issue	Region/area	Transit system	Example	Source
Weak implementation of the transit system	ECOWAS	ISRT	ECOWAS countries imposing controls at the point of entry for cargo in transit	Zerelli et al. (2008)
			Lack of coordination among national guarantors of the ISRT	Zerelli et al. (2008)
	Greater Mekong Sub-Region	Cross-Border Transport Facilitation Agreement	Lack of full ratification of agreement and protocols	ADB and Australian Aid (2013)
			Limited awareness of the agreement in some participating countries	ADB and Australian Aid (2013)
COMESA	RCGT	Adhering countries not applying the RCTG scheme, owing to lack of buy-in and sensitisation of the government and private sector	Mpata and Mwakalombe (2011)	
Procedures irregularities	Afghanistan and Pakistan	Afghanistan Pakistan Transit Trade Agreement	Insurance guarantees not being released owing to stringent conditions by Pakistan Customs and lack of cooperation by Afghan Customs; guarantee rates high compared with market rates	Deloitte (2012)
	ECOWAS	ISRT	ISRT logbooks (transit documents) not compliant with regulations	Zerelli et al. (2008)
			ISRT logbooks not issued by the same authority, therefore not recognised by other countries	Zerelli et al. (2008)
Harmonisation of regulations	ECOWAS	ISRT	Controls on axle load not widely applied	Zerelli et al. (2008)
	Pakistan, Kyrgyzstan, Kazakhstan and China	Quadrilateral agreement for traffic in transit	Lack of agreement on trade facilitation measures and Customs to Customs cooperation	Deloitte (2012)
Lack of reciprocal treatment	Pakistan and China	Bilateral Agreement between Pakistan and China on International Road Transport	Chinese authorities do not allow vehicles to go further than 120 km from the border	Deloitte (2012)
	Pakistan and Iran	Bilateral Agreement on Road Transportation between Pakistan and Iran	Iranian authorities charge excessive fees for entry of Pakistan trucks	Deloitte (2012)
Other	Pakistan, Kyrgyzstan, Kazakhstan and China	Quadrilateral Agreement for traffic in transit	Route defined under the agreement is not considered economically feasible	Deloitte (2012)
	Cambodia and Vietnam	Cross-Border Transport Facilitation Agreement	Transport permit quota limiting cross-border transport between Cambodia and Viet Nam to 500 (for each country) goods, vehicles and passengers at a total of five crossing points	ADB and Australian Aid (2013)

Focusing on South Asia, the background paper by De (2015) provides further evidence of factors undermining the effectiveness of agreements governing transit between Bhutan, India and Nepal. Despite the presence of bilateral transit agreements between these countries, and the recent introduction of the Motor Vehicles Agreement (MVA) between Bangladesh, Bhutan, India and Nepal (BBIN), transit between the countries in the region

continues to be characterised by weak regulation, lack of competition and the dominance of large transport operators. Box 8 discusses these issues.

Box 8: Factors undermining the impact of transit agreements governing transit between India, Bhutan and Nepal

Traditionally, transit in the South Asian region has been regulated by bilateral agreements between countries (De et al., 2012). Efforts to improve the transit framework have been ongoing and, in 2014, South Asian nations negotiated and agreed on an MVA during the South Asian Association for Regional Cooperation (SAARC) summit in Kathmandu (Rahman, 2015). However, Pakistan did not sign the agreement, leaving the BBIN countries to agree on and sign a new MVA in June 2015 (Government of India, 2015a).

The BBIN MVA sets up a framework to facilitate transit in the region. Cargo and passenger vehicles of authorised operators registered in any contracting country are allowed to circulate in the other countries on receiving a permit. It also establishes a few rules transporters need to abide by. Drivers from one country driving into the territory of another contracting party need a number of documents readily available for inspection: registration, insurance, environmental certification and others listed in the agreement. These must be available for the entire time spent in the territory of another contracting party. No additional charges will be levied on foreign vehicles other than those applied on local vehicles.

The agreement also requires the installation of a tracking system on vehicles and containers within two years from the signing of the agreement. This is to be done at the expenses of the transporter.

The MVA is not a deep agreement, as it provides a framework for cooperation on transit matters but does not set harmonised standards. Instead, it gives each country the ability to regulate transit. For example, the MVA does not set a uniform fee level for the countries. Rather, each country is encouraged to set their own. In addition, contracting parties can establish the number of cargo and personal vehicles and volume of traffic allowed to transit in their territory under the agreement.

In addition to that, the MVA sets various restrictions that effectively limit transit in the region. For example:

- Cabotage: vehicles registered in one country will not be able to transport local passengers and goods within another country. This limits competition in the region as, effectively, only national firms are allowed to operate in the domestic transport industry.
- The agreement also does not allow repair works to be carried out in another contracting party, unless there is a major accident or breakdown. Therefore, if a truck is damaged in another country, no major repair work can be undertaken in that country, and the driver has no choice but to return to his country to fix the vehicle. This is effectively a localisation barrier, and it discourages transit within contracting parties.
- The agreement establishes that at least one member of the crew of the vehicle must be able to communicate in English, or in a language understood in transit or in the destination contracting party. This requirement effectively translates into a localisation barrier, as it limits the right of citizens of one contracting party to transit in the other contracting party.

The MVA has been introduced only a few months ago – therefore its effect might not yet be noticeable. However, the agreement does not ensure a freer, smoother transit in the region. On the contrary, it contains many limitations to the free movement of vehicles in the region. Therefore, it is unlikely that it will yield significant results.

The uncertainty about the positive effects of the transit framework in the sub-region is consistent with findings on the ground in Bhutan, India and Nepal. The background paper by De (2015) indicates that several factors continue to undermine the free movement of vehicles between these countries and influence the nature and type of transport operators that engage in transporting goods within the sub-region. First, weak implementation of the agreements that govern the transit system means road transporters remain mostly unregulated.

Second, a number of issues constrain competition in the transport sector. For instance, the small fleet size of Nepali truck operators means they struggle to compete with Indian operators to transport cargo to or from Haldia or Kolkata ports. Furthermore, the requirements in India that truck operators have drivers' insurance, be granted permission by Indian authorities to operate in India and adhere to fixed times of entry and exit, plus financial guarantees, also discourage Nepali trucks from operating in India. The result is that Indian trucks dominate the transport of imports to Nepal from Haldia and Kolkata ports.

Finally, the smaller operators (mostly from Bhutan or Nepal) struggle to operate along the transit corridors from Haldia or Kolkata ports to Bhutan and Nepal on profitable terms. Both hard and soft infrastructure problems, such as poor-quality road surfaces, narrow roads, congestion and a lack of flexibility in travel times, interact to slow down transport along the key transit corridors. This tends to have a greater impact on small transport operators, making it particularly difficult for them to operate on a profitable basis

4.3. Conclusions and policy implications

This chapter has presented new evidence that regional infrastructure is important for firm productivity. Not only do regional exporters have higher productivity than other firms but also they experience greater productivity growth. Furthermore, the productivity-enhancing effects of regional infrastructure do not come only from the exporting side – the overall effects of regional infrastructure on firm-level productivity can work through both exporting and importing. Firms in countries with better regional infrastructure (reflected in the quality of infrastructure in their neighbours) also have relatively higher productivity. This suggests investments in regional infrastructure have long-lasting effects on firm productivity.

We also provide evidence of significant variation in transaction costs associated with use of regional infrastructure. These costs can vary markedly between regional infrastructure in different areas, but also across different types of firms using the same regional infrastructure facilities. This suggests it is not just the quality of regional hard infrastructure such as roads and ports that influences trade costs and firm productivity; other factors are present that impact on the transaction costs of trade, the capacity of firms to trade and, ultimately, their productivity. These factors include regulatory barriers that affect the efficiency of trade logistics services and compromise the effectiveness of regional infrastructure facilities, thereby serving to raise trade costs.

This points to clear elements of complementarity in the interaction between regional hard infrastructure and soft infrastructure in reducing trade costs (Portugal-Perez and Wilson, 2012). Thus, policies designed to improve the efficiency of trade logistics services and other aspects of soft infrastructure both within and between countries can serve as important mechanisms for unlocking the trade-inducing benefits of improvements in regional infrastructure. With this in mind, we suggest the following complementary policies and initiatives.

Eliminate discriminatory regulations in the transport and freight sectors that prevent foreign service providers from operating in domestic markets. The presence of foreign logistics firms in these sectors can help boost the availability, quality and efficiency of transport and freight services. Policies to eliminate discriminatory regulations should be targeted in particular at removing the following forms of localisation barriers:

- Cabotage restrictions that prohibit the carriage of domestic cargo by a foreign operator and enable local transport operators to monopolise maritime, aviation and road transport services in certain territories;
- Cargo reservation schemes that require portions of international cargo to be carried by national flag vessels;
- Third country rules that prohibit trucks from a third country from transporting goods between two other countries;
- Restrictions on reciprocal access that prevent trains or trucks from passing through particular territories along key transport routes.

Remove more general localisation barriers that cut across multiple logistics sectors and shield domestic logistics service providers from foreign competition. These include restrictions on the total value, type or number of logistics services foreign firms may provide and regulations that prohibit foreign firms from obtaining operating licences to perform specific functions. A more substantial presence of foreign logistics firms in domestic and regional markets can help boost competition in individual logistics industries and, in this way, improve the availability, quality and efficiency of trade logistics services.

Revisit efforts to harmonise cross-country standards and regulations affecting trade logistics services. This can be most easily achieved at the regional level.

- In many regions, cross-border trade continues to be hampered by a lack of standardisation of customs processes and other administrative procedures across countries. Inconsistencies in the application of customs laws and procedures both between and within countries are also problematic. In some cases, this is exacerbated by a lack of coordination and poor cooperation across border agencies or between different departments, which generates inefficiencies through the duplication of efforts. In almost all settings, there remains considerable scope to develop policies that harmonise customs processes and procedures between countries at the regional level.
- In other cases, there is a need to improve the implementation of existing harmonisation policies. For instance, it is necessary to accelerate efforts to standardise axle load limits across countries in SADC and in West Africa. Full harmonisation of axle loads limits in these regions would have positive effects in the form of enhanced safety, more efficient transportation of goods across borders, reduced transit times and less damage to road and highway infrastructure.

Carefully consider the economic impact of specific types of local content requirements (LCRs) on individual economies. The primary economic motivation behind LCRs is to localise production by locating the investment or production activities of foreign firms in the domestic market. It is envisaged this will create jobs and enhance domestic capabilities through local production of goods and services, and, in some cases, facilitate the transfer of technology and intellectual property from foreign to domestic firms in the sectors in which the LCRs are applied. What are not always considered are the adverse effects these LCRs can have on employment in non-targeted sectors, and more generally on economic diversification, the ability of domestic firms to access intermediate inputs and to integrate into GVCs, and on overall competitiveness in domestic economies.

Ensure effective access to hard infrastructure. The efficiency of trade logistics services can be undermined by restrictions on access to the critical infrastructure facilities that support the provision of these services. In some cases, the elimination of these restrictions may require the removal of regulations and legislation that prohibit logistics operators from utilising certain facilities (e.g. domestic laws that prevent airlines from operating at foreign airports or regulations that prevent foreign maritime firms from gaining access to government-owned port facilities). In other settings, it may require efforts to improve competition and remove conflicts of interest in the ownership of these facilities. Finally, it may also require upgrades and extensions to existing infrastructure that alleviate congestion problems that undermine the efficiency of the crucial infrastructure services supporting logistics operators.

5. Conclusions and policy options to increase the benefits of regional infrastructure for trade facilitation for the poor

Having examined the evidence on the impact of regional infrastructure in three clusters, this concluding chapter links the evidence presented in this report to the three central questions in the project:

What is the evidence that improvements in regional infrastructure designed to increase cross-border trade in Sub-Saharan Africa (through reducing the costs of trade, including costs caused by delays – principally transport) result in poverty reduction (i) indirectly as a result of economic growth; and (ii) directly?

What are the potential risks to the poor created by trade growth resulting from improvements in regional infrastructure?

What policy interventions have the capacity to increase benefits for the poor and mitigate potential harm to the poor?

We used economic theory and empirical evidence to build a theory of change that is comprehensive in emphasising a series of potential pathways of impact of RITF on growth and poverty reduction. There are potentially positive and negative impacts. The evidence linking the provision of RITF directly to growth and poverty reduction is scarce. To address this, this project has brought together the main findings of six background papers to tackle knowledge gaps and provide new evidence.

We summarise the available evidence in Table 5.

Table 5: Summary of new evidence presented in the report

	Border activity (Cluster 1)	Value chain integration (Cluster 2)	Efficiency of customs and firm productivity (Cluster 3)
Evidence on impact	<p>Positive impact through influence on the location of economic activity (reduction in spatial inequality in regions close to the border).</p> <p>Positive impact on informal workers and traders with better work conditions and increased opportunities.</p>	<p>Regional infrastructure facilitates value chain integration.</p> <p>Warehouses and warehouse services illustrate the potential of complementary infrastructure to address coordination failures. Allow smallholder participation in modern value chains and let them ‘move up’ and capture margins previously caught by other players.</p>	<p>Efficient regional infrastructure and customs help regional exporting and importing. They also matter for domestic firms’ productivity.</p> <p>Existence of plethora of barriers to efficient logistic services reduces pass-through of the reduction of trade costs to economic actors throughout the chain.</p>
Risk to the poor	Might be no impact or even a reversal of benefits without the development of secondary	No capacity for small firms to access the market and enter	Import competition and regional export opportunities

Policies to raise benefits to the poor	road networks, ICT infrastructure and health and education infrastructure. Some informal workers can lose out. Also potentially no or negative impact if the specificity of informal traders are not considered the design and implementation phases.	value chains without supporting services.	help those firms that can respond. There will be no impacts from the reduction in trade costs from RITF if it does not pass through to all economic actors and in particular the poor. Regulation preventing efficient logistic services can create rents.
	Recognise specific characteristics of informal trading. Complementary infrastructure and policies to cover the 'final mile' with secondary road networks and transport services, ICT infrastructure and health and education infrastructure to sustainably reduce spatial inequalities.	Complementary policies (e.g. regulatory framework) and complementary services to address coordination failure and integrate small firms in the value chain.	Addressing barriers to entry and in particular localisation barriers decreasing the efficiency of logistic services. Find more efficient transit mechanisms for land locked countries.

5.1. Evidence on impact and risks

The evidence gathered in this report clearly highlights that, on aggregate, there is a strong relationship between increased trade openness and growth, with various pathways of impact on a set of stakeholders, in particular households and firms. This report provides new evidence about the direct and indirect impact of RITF.

Chapter 2 focused on the effect of cross-border infrastructure on the location of economic activity and on informal actors – traders and workers – at the border.

Section 2.1 highlighted the effects of cross-border infrastructure on the location of economic activity, which may reduce spatial inequalities within countries. This suggests easier border crossing creates economic activity and livelihood opportunities in regions closer to the border (and not the main cities closer to the centre of the country). Promoting inclusive and sustained development of new economic clusters will, however, require the provision of both complementary hard infrastructure (rural feeder roads, energy and communication) and the provision of health and education services in developing urban centres.

The analysis of the impact of a better-functioning cross-border infrastructure (Section 2.2) shows the predominantly positive impact on informal activities at the border, whether on informal traders or other activities.

New cross-border infrastructure often aims to make formal trade more efficient without specific consideration for informal traders, often pedestrian or on light modes of transportation. Moreover, there is usually no competition between formal (e.g. trucks moving goods from one city to another) and informal traders. Therefore, their activity is not directly affected by the increase in formal trade flows. Indirectly, the reduction in congestion at the border can be positive for informal traders and they often have to take the same cross-border path as formal traders and are forced to navigate between trucks.

This points to a crucial step necessary to better support all cross-border economic actors and in particular cross-border traders: it is important to acknowledge the characteristics and constraints but also the importance and potential of their economic activity for the livelihoods of local populations across the border.

Facilitating border crossing for informal workers, through schemes specific either to their characteristics (gender, language) or to the small scale of their economic activity, has proven to decrease their vulnerability and as a result potentially allow for increasing their economic activity. Such initiatives can translate official documentation or creating a specific path through the border. Other complementary institutional settings encompass informal

traders' organisation, which could be the entry point for better communication between customs authorities and informal traders.

Acknowledging the new realities of trade and regionalism, the second cluster focuses on the importance of RITF for value chain creation and integration. After emphasising the link between GVC integration, growth and job creation, we provide new evidence of the importance of RITF for GVC integration in Africa.

Section 3.2 highlights the benefits of addressing infrastructure for trade facilitation at the multi-country level.

The findings suggest it is not just what a country does that matters for its connectivity but also what its neighbours do. African policymakers, as well as donors and multilateral agencies, need to redouble their efforts in this area, including in the context of AfT. Mechanisms at the regional level might then be necessary to address potential asymmetries in costs versus benefits of regional infrastructure.

The case study in Section 3.3 highlights that key complementary sets of domestic and regional soft and hard infrastructure are necessary to ensure inclusiveness and increased domestic linkages to international production networks.

The case study of smallholder maize production in Kenya highlights the complementarity among different types of hard infrastructure (roads and warehouses) and between hard and soft infrastructure (warehouse receipt system regulation, standard harmonisation and transport competition). This complementarity helps to reduce risk, tackle coordination failure and increase stakeholder investment in value chains. Such developments not only can increase employment generation but also allow for an upgrade in value chains with increased productivity and scaling up economic activities. Hence, investing in the appropriate infrastructure and regulation can unlock economic transformation. In particular, it can allow smallholders to participate and even upgrade in the value chain. Facilitating smallholder entry in the value chain and making use of their untapped production capacity as well as supporting regional trade can also be a way to increase food security in the region.

The final cluster of the report focused specifically on the productivity of firms as one important potential impact of investments in RITF. It showed regional trade (exports in particular) has a long-lasting effect on productivity of exporting firms compared with non-exporting firms. Regional exporters are better performers; policy that facilitates regional trade can have long-lasting impacts in addition to the short-run gains from trade. The evidence also shows the impact of regional infrastructure on firm-level productivity, encompassing the effects through exporting as well as importing. We would expect firms that are linked into global networks to be able to source the best-quality inputs and hence improve production quality in this way. Such firms would also be able to learn from their suppliers, increasing productivity through importing. These effects will be multiplied with good-quality infrastructure: the impact of regional infrastructure on productivity should be higher when firms import inputs and supplies. The evidence supports this, as the impact of regional infrastructure is greater for firms that import some material inputs and supplies. All the evidence points to a further important finding: importing is associated with higher productivity, and regional infrastructure can support these links.

An important by-product of our analysis is the observation that border crossing costs vary by firms for the same gateway, suggesting there is more to regional infrastructure than hard infrastructure, for example soft infrastructure such as logistics services. The section then examines the link between RITF and productivity by looking at efficiency of logistic services.

The analysis identifies a full set of barriers to efficient logistics services, and in particular localisation barriers, which reduce competition in regional logistic services, thereby reducing the impact of new provision of hard infrastructure throughout the chain.

Efficient regional logistic services are of particular importance for landlocked countries. Poor implementation and a lack of enforcement of transit agreements still undermine the efficiency of trade for landlocked countries, lessening the productivity of firms (through imports) as well as their competitiveness (exports).

Overall, the risks for the poor are not very different from the risks introduced by trade liberalisation. The theory of change clearly highlighted these potential impacts. However, infrastructure investment completed by specific support and regulatory environment is likely to unlock opportunities in a way trade liberalisation cannot.

Therefore, addressing infrastructure and conceptualising complementary policies at the regional level can potentially decrease negative impacts and increase efficiency compared with a country acting on its own. Coordination for investments in RITF is crucial in amplifying the positive benefits.

In particular, to secure a poverty reduction impact, the report also highlights the need for investments in specific types of infrastructure able to open up cross border market opportunities for small-scale producers in lagging regions. This infrastructure should enable connection to regional corridors. It can be consolidation facilities (e.g. warehouses), border markets or logistics platforms to facilitate market exchanges and minimise post-harvest losses, as well as dedicated channels and procedures facilitating small-scale cross-border trade flows. These types of interventions would tackle the major sources of costs for small-scale traders in areas with thin economic densities.

5.2. Policy implications

Each of the chapters in this report identified specific policy options that would increase the benefits of RITF and reduce the potential risks for the poor from greater integration in regional trade. These policy options can be summarised into two broad sets according to their overarching objectives. The aim of the first set is to maximise the impact of investments in regional hard infrastructure on growth and poverty reduction by investing in complementary hard infrastructure as well as in improvements to soft infrastructure in order to unlock the positive effects of RITF and ensure these are passed on to all economic actors in the economy in the form of lower trade costs and, ultimately, lower prices. Such transmission is key to ensuring that even the most vulnerable and isolated people and regions benefit from regional trade integration.

One option to generate greater efficiency in regional infrastructure investments is to coordinate large investments through regional agencies. This could allow for economies of scale and facilitate, for example, the creation of multimodal corridors that link landlocked countries to the ports of gateway countries. It would also make it possible to undertake initiatives to develop different types of complementary infrastructure on a joint basis.

The importance of complementary measures should not be underestimated. As trade facilitation presents new opportunities to workers and producers, both creating and displacing jobs and activities, complementary policies and initiatives can facilitate the appropriate supply response (e.g. through supporting migration or enhancing labour mobility). Such measures could take several forms. Regulatory reforms could be initiated to support investment and raise competition in trade-related services (including logistics). They could also target greater transparency and stability in the implementation of trade agreements and rules, or in markets and in access to information that facilitates better transmission of prices to the benefit of producers, traders and consumers. Complementary improvements to intermediary hard infrastructure – such as rural feeder transport networks and access to storage facilities – are also important, as are complementary measures that provide technical or financial assistance to small producers in order to enhance their ability to access markets.

The objective of the second broad set of policy options is to ensure populations in different countries (and particularly the most vulnerable individuals in these countries) are not adversely affected by the greater level of integration and lower trade costs that come with increased trade facilitation.

This requires significant consultation with key stakeholders in the planning and implementation of regional infrastructure development initiatives. The private sector can play a key role here. Institutions such as business associations can provide valuable input into the identification of barriers to regional integration, highlighting specific bottlenecks that businesses face and which need to be addressed. Involving the private sector in the process also provides a way to highlight the new opportunities available to businesses through the development of regional infrastructure, while ensuring businesses are better prepared to deal with the prospect of increased competition that may accompany greater regional integration. More broadly, dialogue and the formation of partnerships among groups affected by reforms in specific value chains, sectorally and at the national level, should be promoted.

At the same time, compensatory and support mechanisms can help ensure countries (and firms and vulnerable members of the population in these countries) are shielded from certain adverse effects that may arise under a

deep integration process. These could include, for example, support for countries to improve their business environments.

Finally, important political economy dimensions need to be considered when developing policies to drive RITF. Many of these dimensions permeate the issues of regional infrastructure planning and implementation discussed above. The promotion and development of regional infrastructure necessarily involve a multitude of different actors, many of which may have opposing interests and objectives. This not only entails competing agendas across countries but also potentially conflicting objectives between governments and the private sector.

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Annex 1: Categorisation of localisation barriers to efficiency of trade logistics services

Category	Issue	Types of barriers and inefficiencies	Illustrative examples
Transport and freight services	Cabotage restrictions	Regulations that prohibit the carriage of domestic cargo by a foreign operator, instead requiring the use of local transport operators (applies to maritime, aviation and road transport services).	<p>Cabotage is prohibited in Zambia and most countries in the SADC (Vilakazi et al., 2014). Furthermore, recent studies have suggested there is little appetite among SADC member states to eliminate cabotage restrictions (McKinnon, 2012). This means that in much of Southern Africa (for the time being at least) domestic goods may not be carried by a foreign operator, thereby shielding domestic operators from foreign competition.</p> <p>In Indonesia, regulations that limit the right to cabotage to Indonesian-registered vessels have been in place since January 2011 (Stone et al., 2015). The Indonesia government did, however, recently relax cabotage restrictions on foreign-flagged vessels serving the country's oil and gas sector (PriceWaterhouseCoopers, 2014).</p>
	Cargo reservation schemes	Requirements for portions of international cargo to be carried by specific carriers or service providers (typically national flag vessels).	In India, only Indian flagged vessels or those chartered by an Indian citizen or company (operating under a licence granted by the director general of shipping) are permitted to carry cargo between ports in India. For their part, foreign flagged vessels may do so only if no Indian flagged vessels are available (Motiwala, 2015). This is despite the reality that operating costs are 35-40% higher for Indian-flagged vessels compared with their foreign counterparts owing to taxes levied exclusively on Indian shipping lines (Government of India, 2015b). It is estimated that removal of these cabotage restrictions in India would reduce logistics costs for the end customer by 40-45% (ibid.). Growing consideration is being given to relaxing these laws (Port Finance International, 2014).
	Third country rules	Rules that prohibit trucks from a third country from transporting goods between two other countries.	Third country rules are applied widely in the SADC (Vilakazi et al., 2014) and are explicit in the bilateral transport

		agreements that have been signed in the region. In outlining the impact of these rules within the region, Newfarmer and Pierola (2015: 105) note that: ‘These regulations are aimed at protecting domestic transport companies, particularly the smaller operators, from foreign competition, but they have the effect of reducing truck capacity utilization (because of empty hauls) and increasing transport prices.’
Axle load limits	Differences in axle load limits across countries.	<p>In Southern Africa, progress towards standardising axle load limits has been slow. This is particularly true across the different RECs, with SADC and COMESA employing different limits (Newfarmer and Pierola, 2015). For instance, Mozambique and Tanzania do not allow the seven-axle interlinks, while other countries in the region do (ibid.). These discrepancies mean a truck may be correctly loaded in one country but not in another.</p> <p>In West Africa, uneven implementation of policies designed to harmonise axle load limits across countries has resulted in the frequent overloading of trucks engaged in cross-border shipments. This not only creates serious safety problems, but also serves to damage roads and highways and increase transit times (Chambers et al., 2012).</p>
Cargo handling restrictions	Restrictions on the loading and discharging of cargo on and off ships, planes and trucks (de Souza et al., 2007).	Policies in operation for most public ports in the Philippines have intentionally led to a monopolisation of cargo handling. The Philippines Port Authority, which acts as both a landlord and regulator of public ports in the country and grants cargo handling licences, employs a policy of granting licences to a maximum of two cargo handlers in any port with the exception of Manila (Aldaba and Pasadilla, 2013).
Hours of operation	Restrictions on the hours or days of operation for transportation or for the loading and discharging of cargo on and off ships, planes or trucks (these operations may be restricted on certain days or at particular times).	Most major cities in China do not allow day-time access for trucks. In Beijing, for instance, trucks carrying goods are allowed to enter the city only between midnight and 3am (Tatlow, 2014). Amid unhappiness among receivers of goods, who have to absorb the additional costs of receiving goods during night-time hours, the city has enacted some exceptions to these bans (Transportation Research Board, 2015). Furthermore, according to Hollweg and Wong (2009), the regulation has been applied unevenly in the past, with anecdotal evidence suggesting it is often targeted towards foreign transport and logistics firms while local operators are not forced to comply fully.
Freight flow imbalances	Unidirectional demand for freight services resulting in trucks travelling one-way unladen.	In the majority of African countries, opportunities for domestic truck operators to carry return loads or backloads are

Licensing and service restrictions			constrained by limited production of goods, particularly in rural areas (Nleya, 2014). Trucking companies often factor the lost revenue from a lack of a return load into their price for the initial leg of the journey, thereby raising the price of the service. This occurs frequently in Malawi, where empty backloads are common on rural routes, contributing to the relatively high domestic transport prices compared with other countries in the Southern African region (ibid.).
	Vehicle equipment limitations	<p>Limitations on fleet size and equipment usage.</p> <p>Regulations that prohibit foreign service providers from owning and operating ground transportation fleets and equipment.</p>	Foreign operators are prohibited from owning and operating ground transportation fleets and equipment in Vietnam (USITC, 2005).
	Reciprocal access	Lack of reciprocal access rights between operators, meaning trains or trucks need to be exchanged at national borders.	In Zimbabwe, while the railway network is connected with those of other national networks, a lack of reciprocal access rights between operators prevents train services from operating through Zimbabwe along the North–South Corridor. The result is locomotives must be changed at national borders (Newfarmer and Pierola, 2015).
	Limits on service provision	<p>Limits on the total number of providers in specific logistics industries.</p> <p>Restrictions on the total value, type or number of logistics services that foreign firms may provide (Biljanoska and Trajkov, 2011).</p>	<p>In Zimbabwe, the number of service providers in the telecommunications and air transport sectors is restricted, with these sectors dominated by state-owned enterprises (Newfarmer and Pierola, 2015).</p> <p>In Argentina, all transport services (water transport and other transport) utilised by the mining industry must be locally sourced (Stone et al., 2015).</p>
	Licensing requirements	<p>Limits on the number of licences granted to new logistics operators (Biljanoska and Trajkov, 2011).</p> <p>Regulations that prohibit foreign firms from obtaining brokerage licences.</p> <p>Regulations that require separate brokerage licences for maritime ports and airports.</p>	For trucking firms in Greece, procedural requirements to obtain operating licences often involve duplication. This is because some municipalities issue trucking licences in addition to those issued by national authorities, meaning trucking firms are often required to follow identical procedures in parallel in order to obtain licences from both local municipalities and the national department of transport (Watanuki, 2015).
Ownership and investment	Joint venture requirements	Regulations that only permit market access to foreign firms that enter into a joint venture with a domestic operator (Kunaka et al., 2013).	In Vietnam, despite opening up the logistics sector to foreign-invested enterprises, some markets for logistics services remain closed to wholly owned foreign companies. For instance, foreign providers of container handling and road transport services in Vietnam are permitted to operate only in joint ventures with Vietnamese partners (Morris, 2014).

Labour market restrictions			Similarly, in Indonesia, foreign investment in courier, express delivery and other postal-related logistics services is limited to joint ventures with foreign partners holding a maximum equity share of 49% (USTR, 2015). Foreign postal service providers are also only permitted to operate in provincial capitals with international airports and seaports (ibid.).
	Foreign equity participation and restrictions on FDI	Limits on the percentage of foreign capital that can be invested in domestic logistics companies (Biljanoska and Trajkov, 2011). Legislation that prohibits foreign firms from investing locally.	In Mexico, foreign investors are permitted to hold only up to 49% of the capital stock in companies engaged in provision of railway services (PriceWaterhouseCoopers, 2015). Any foreign participation above the 49% threshold requires prior authorisation from the Mexican Foreign Investment Commission. There are also limitations on foreign ownership in certain port and air transportation services in Mexico (EC, 2015).
	Financial preferences and investment incentives	Provision of financial benefits and incentives – such as land grants, low interest rates, subsidies and tax incentives – to domestically-owned firms or goods that are produced locally and not foreign firms and foreign goods	Tax breaks are provided for domestic logistics service providers in South Korea, while their foreign counterparts do not benefit from these incentives (USITC, 2005).
	Restrictions on the employment of foreign labour	Limits on the foreign share of the labour force or on the share of foreigners' salaries in total salaries (Biljanoska and Trajkov, 2011). Requirements for foreign firms to hire local residents.	The South African government strictly enforces prohibitions on foreign drivers working for locally registered trucking firms. In some cases, this means trucks are required to change crews at border crossings (Kunaka et al., 2013).
	Visa restrictions	Limits on the granting of visas to foreign logistics operators.	Afghanistan's ability to implement the TIR system continues to be hampered by neighbouring TIR member countries (including Iran, Uzbekistan, Kazakhstan and Turkmenistan), which refuse to grant visas for Afghan drivers (Wadsam, 2015).
Hard infrastructure	Restrictions on access to infrastructure facilities	Firms that own crucial infrastructure facilities prevent competitors from accessing these facilities or impose onerous conditions for the provision of access to their facilities (Kunaka et al., 2013). Domestic laws that prevent airlines from operating at foreign airports. Regulations that prevent foreign maritime firms from gaining access to government-owned port facilities or providing their own or third-party port-related services, which may result in monopolised handling of port-related facilities and services.	In Egypt, port authorities perform multiple roles as owners, regulators and operators of ports. They provide, for example, pilotage and safety and tugboat services, and own the companies that provide stevedoring services. This is said to generate conflicts of interest and results in a lack of competition, both of which hinder the development of the country's maritime ports and undermine the efficiency of port-related logistics services (Kunaka et al., 2013). In Bangladesh, Indian-owned trucks are currently not permitted to pass through the Bangladeshi road network in order to transport goods from mainland India to its North East States (Kunaka et al., 2013). This means the trucks are forced

Customs and border management		Requirements to provide services using local facilities and infrastructure (Stone et al., 2015).	to take roundabout routes to transport goods to these Indian territories, thereby raising transport costs.
	Congestion effects	Congestion at ports, terminals, border crossings and points of entry and exit for goods that undermines the efficiency of these crucial infrastructure services (Abe and Wilson, 2009).	Congestion at ports in Lagos, Nigeria, means ships often have to queue for days or even weeks before they are able to berth and discharge their contents. According to Gidado (2015), the high level of congestion means up to 21 vessels may be waiting at any one time to berth.
	Customs documents	Onerous documentation requirements for exporting or importing goods, with multiple documents (including permits and certifications) required for goods to be passed through customs.	In Tajikistan and Uzbekistan, the worst-performing countries in terms of the number of documents required to export goods in the World Bank's latest <i>Doing Business</i> indicators, 11 separate documents are required per shipment. These countries also perform relatively poorly in terms of time taken to export, with 71 days (on average) required to comply with all procedures required to export goods in Tajikistan, for example.
	Customs brokers	Limitations on the customs brokers that may be used to enter and clear goods through customs (Hollweg and Wong, 2009).	In Indonesia and Malaysia, firms are required to set up a separate corporate entity in order to obtain a customs brokerage licence (Goh et al., 2008).
	Customs clearance times	Delays in clearing imports and export through customs. Limits on the hours of operation of customs facilities.	In Malaysia, customs do not operate on weekends. As a result, goods arriving at customs facilities on Friday are forced to wait until the following Monday for processing (Hollweg and Wong, 2009).
	Variation and lack of coordination in administrative procedures	Lack of standardisation of administrative procedures across countries. Lack of coordination and poor cooperation across border agencies, resulting in duplicate border procedures. Lack of coordination between customs and quarantine departments. Inconsistencies in the application of customs laws and procedures between different points of entry in the same country.	In the Dominican Republic, an obsolete legal and institutional framework has enabled customs officials to exercise considerable discretion, leading to uncertainty regarding how customs rules and regulations will be applied (Nordås et al., 2006). The efficiency of logistics services in Bulgaria's textile industry is hampered by the need for transport service providers to approach different agencies separately, as well as a lack of integration in approval and payment processes and a lack of data-sharing across agencies (Nordås et al., 2006). There is a lack of coordination in the management of trade in dairy products between landlocked countries in Central Asia (Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan). According to Nordås et al. (2006), poor coordination between these countries increases transit times by 25-40%, thereby raising the cost of transporting dairy from the Kyrgyz Republic to the other countries. They also show inefficiencies at border crossings have a profound impact on

Insurance			the time taken to transport cargo from Almaty in Kazakhstan to Europe (via Moscow), and estimate that more than 50% of the transit time is spent idle with cargo waiting at border facilities along the route.
	Corruption	Hassles, bribery, extortion and other informal practices at checkpoints and roadblocks along transport corridors and at border posts (Chambers et al., 2012). Customs fraud, including unauthorised tolling by customs officials.	In West Africa, unofficial roadblocks stationed along key transport corridors result in high transaction cost for intra-regional trade, in the form of both time delays and additional financial costs (Chambers et al., 2012). One World Bank study revealed that, during transportation of goods from Ghana to Nigeria (via Togo and Benin), trucks encountered as many as 37 official and unofficial roadblocks (World Bank, 2007). As Chambers et al. (2012: 16) explain, 'checkpoints, both official and unofficial, are associated with significant delays and official charges as well as harassment, bribery and extortion. The sheer number of checkpoints can be overwhelming for truckers, with separate roadblocks established by agents from the customs, police and forest services; even villages, towns and districts erect roadblocks. Bribes are often organised and everyone from the agent on the road to their highest level superiors receives their share of the gains.' According to a study by McKinnon (2012), Tanzanian truck operators travelling through Zambia to deliver goods to DRC face numerous roadblocks and weighbridges as well as excessive road toll charges and fines along the corridor.
	Variation in third party liability insurance	Different requirements for third party liability insurance across countries (Raballand et al., 2008).	In Southern Africa, different regimes are used for third party liability insurance. Specifically, three core systems are used for cross-border transport: cash payments; a fuel levy; and the Yellow Card system. A lack of harmonisation across these three systems particularly affects cross-border transport involving Mozambique (Raballand et al., 2008).

Note: Some of the examples provided in column 4 are somewhat dated. While attempts have been made to provide up-to-date examples, there may be instances in which the inefficiencies referred to in these examples have already been addressed or the regulations altered or repealed. Nevertheless, they still provide practical examples of the type of barriers to the efficiency of trade logistics services that have existed in the past in particular settings.

Annex 2: Policy suggestions from background papers and clusters of the report

Policy suggestions from the literature review

Two broad policy suggestions follow from this literature review.

The first is the importance of the complementarity of various types of infrastructure in ensuring the maximum contribution of (regional) hard infrastructure projects in fostering growth and poverty reduction.

The literature examining the pathways to growth and poverty reduction – through prices, jobs, investment and output – emphasises the importance of complementary policies. Complementary policies enable the pass-through of lower trade costs to lower prices in the entire economy. Such transmission is key in ensuring even the most vulnerable and isolated people and regions benefit from regional trade integration and increased food security. It requires the participation of isolated stakeholders in commercial markets.

As jobs and activities are created and displaced, and trade facilitation presents new opportunities to workers and producers, complementary measures are needed to allow a supply response. Such complementary policy could be for instance to make migration easier, to enable labour mobility across space.

Therefore, in order to optimise the contribution of regional infrastructure to inclusive growth investments in regional hard infrastructure and according to this literature review, we suggest the following complementary policies and initiatives:

- Coordination of large investments through regional agencies to avoid suboptimal level of investments and
 - Allowing for multimodal corridors linking landlocked countries to gateway countries' ports;
 - Taking into account the complementarity among several types of infrastructure, for instance undertaking both transport and communication infrastructure development jointly. The same applies to customs and corridors.
- Policies supporting investment and competition in trade-related services including the logistics services sector. This can for instance include
 - Regulatory reform that addresses the governance and political economy of freight logistics;
 - Facilitating and stabilising policy and regulatory processes. There needs to be more transparency and stable implementation of trade agreements and trade rules to prevent policy volatility. This would allow for more market predictability necessary to unlock private sector investment.
- Improved intermediary hard infrastructure such as rural feeder transport networks and access to storage facilities.
- Increased transparency of markets and access to information to allow better price transmission mechanisms so consumers, traders and producers gain.
- Support of market access for the smallest producers, through the provision of various support services, including financial but also technical assistance and access to inputs. Increased flexibility and mobility of workers to allow them to benefit from new opportunities in the region.
- Scaled-back levels of ambition regarding integration planning, particularly on regulation and standards harmonisation. This can be done through targeted initiatives after the identification of specific regulatory bottlenecks, or through mutual recognition processes.

The second broad policy suggestion aims to provide support to the countries, population and activities that are the most vulnerable to being harmed by the effects of increased regional integration and reduction in trade costs:

- Support for regions needs to go beyond a simple sequential model – for example moving from goods to services to capital and labour mobility that may not be the most efficient. Planning and implementation of regional infrastructure should be carried out in consultation with institutions such as business associations to
 - Better identify barriers to regional integration and identify relevant bottlenecks to be addressed.
 - Better inform the private sector about new opportunities created by the increased regional integration that results from the development of regional infrastructure.
 - Better prepare the private sector for potential increased competition.
- Identifying whether regional institutions are the most relevant level of aggregation in order to solve various trade-related issues: regions should apply the principle of subsidiarity, according to which the responsibility of a public policy should be addressed by the smallest body able to address it. This would include regional infrastructure design and investment decisions.
- Creating compensation or support mechanisms to be built under a deep integration process, to allow countries with less attractive business environments (natural resources, infrastructure or skills) to make the necessary investments to become more attractive and spur convergence in the region rather than divergence.
- Facilitating dialogue and partnerships among groups affected by reforms at the value chain, sector and national level, particularly as they might entail political economy and governance issues.

Policy suggestions from cluster 1

We now bring together the two previous analyses of the general effects of cross-border infrastructure on the location of economic activity and of the specific effects of cross-border infrastructure on informal workers to draw out a range of policy implications.

The analysis of night light intensity shows that, on average, better cross-border integration and infrastructure reduce spatial inequalities. This is an important policy conclusion in its own right. However, policy can help sustain the reduction in spatial inequalities by fostering new economic activity hubs, for example through further investment commitments in rural areas and small urban centres to support closer markets for rural populations and increased access to public services. This could be through:

- **Connectivity infrastructure.** Investment in corridors could be complemented by investments in rural feeder roads and other connectivity and energy infrastructure to allow rural areas and small-scale cities to fully profit from and sustain the increase in economic activity that better cross-border integration allows.
- **Health and education infrastructure.** Access to public services is a major constraint in remote areas. The increase in economic activity and the economic development of smaller-scale urban centres throughout the country could make investments in health and education infrastructure more efficient, and presents an opportunity to increase access to public services. This would be beneficial for the relatively more vulnerable internal short-term or long-term rural–urban migrants.

Analysis of the specific effects of OSBPs on informal traders suggests how different stakeholders involved in cross-border trade can gain or lose from changes in infrastructure influencing cross-border trade. While informal cross-border traders operate outside the legal framework, in practice they are deeply embedded in the economy, and they provide services and livelihoods to a large number of people. Their informality has a number of causes, including that it is difficult to comply with existing regulations while at same time being profitable. While efforts to formalise these businesses may not be successful or even desirable in the short run, it is still possible to facilitate their trade, allowing them to operate in a safer environment and reducing their vulnerability. In return, this could allow them to scale up and eventually take the formalisation route. Therefore, cross-border infrastructure projects should take the reality of trading at the border into consideration and integrate facilities dedicated to the border crossing of informal traders so they can easily pursue their economic activities. Several measures can be used to

facilitate cross-border trade and ensure a safe environment, while at the same time complying with public health, safety and security requirements. These interventions target both hard and soft infrastructure:

- **Creating specific crossing points for informal traders carrying small cargos, separating informal traders from large cargos and trucks.** These cross-border points should be well-functioning and well-maintained paths and facilities to ensure smooth transit for informal traders, with their goods checked and specific procedures applied for small cargos. The presence of crossing points for informal traders without excessive documentation can reduce the use of illegal routes, and hence the possibility of theft and harassment. Such specific facilities could be a way to emphasise the importance of informal traders to the local economy and change perceptions of this activity among local authorities, which by itself could improve cross-border conditions and decrease incentives for bribery and harassment. An example of this is reported in Brenton and Isik (2012), who mention the presence of two different crossing points (a small and a large crossing point, for small informal traders and for formal traders, respectively). However, they note how these two paths are very different in quality: the one for informal traders is in a poor condition.
- **Increasing the monitoring of interactions between authorities and informal traders to address harassment, in particular for informal women traders.** The use of a border post, cameras and monitors can decrease the occurrence of bribes and harassment. The use of cameras at weighbridges, for instance, has considerably reduced bribery for truck drivers³⁵
- **Making information on procedures and regulations accessible to informal traders through support systems able to address their questions in a timely manner.** This can be done first by addressing language barriers. The language revenue authorities and customs officers use has been reported as an issue because of technicalities as well as a lack of fluency among traders (such as at the Mutukula OSBP, as reported by Saana Consulting, 2015a). Authorities should adapt and translate essential documents and make sure representatives speak various languages. This includes national languages (e.g. Kiswahili in the cases of Kenya and Tanzania) but also local dialects spoken around the border. Second, targeted training provided either by traders' associations or by the customs authorities themselves would help empower informal traders.
- **Engaging regularly with traders associations, to ensure the main issues affecting traders are discussed and addressed.**

Policy suggestions from cluster 2

The literature reviewed in this cluster suggests participation in GVCs can lead to higher value addition in exports, while creating opportunities for SMEs to upgrade production and increase productivity through foreign involvement and learning-by-exporting. However, SMEs typically face a range of challenges in integrating into GVCs. In Sub-Saharan Africa, these challenges are exacerbated by the region's relative marginalisation from global production networks.

From a policy perspective, improvements to infrastructure and trade facilitation can help bridge the gap and enable African countries to better connect to GVCs. There is already widespread recognition of the urgent need to improve infrastructure in Sub-Saharan Africa, and this has only gained importance in the era of GVCs. We have shown in this chapter that there is a clear positive association between improvements along both of these dimensions and value chain connectivity. One way African countries can generate the necessary improvements in these areas is through the implementation of the WTO Agreement on Trade Facilitation.

Regional dimensions are also important for value chain connectivity. The results from our research point to a strong positive association between infrastructure and trade facilitation improvements in neighbouring countries and greater value chain connectivity at home. The evidence provides compelling support for a regional approach to infrastructure development.

In this respect, the growing emphasis in parts of Africa on a corridor approach to infrastructure development seems to be well placed. This can play an important role in generating cross-border spillovers and facilitating the integration of economic units spread across political borders. This should be supported by the development of

³⁵ Personal communication of the authors with the weighbridge operator in Busia.

good gateway infrastructure and strong connections to the hinterland, both of which are particularly important for landlocked countries to successfully integrate into GVCs. African policymakers, as well as donors and multilateral agencies, need to redouble their efforts in this area, including in the context of AfT.

Our research in this cluster has also emphasised the importance of complementarity among different types of hard infrastructure (roads and warehouses) but also between hard and soft infrastructure for unlocking coordination failure in the development of inclusive local and regional value chains. One specific example of the potentially positive effects of this sort of complementarity can be found in the case study we present of warehouses in Kenya. The case study shows investments in key value chain infrastructure such as warehouses and related services have great potential to develop national and regional value chains. However, this requires appropriate policy support, particularly to make these value chains inclusive. In the case of warehouses, policy interventions are required to address coordination failures. In this respect, complementary regulation and policies – such as the introduction of a WRS, developing PPP relationships, and creating collateral through quality infrastructure and extension services – can be introduced to overcome specific market.

More generally, the combination of hard and soft infrastructure is important for enabling domestic producers, particularly small-scale producers, to overcome market access constraints and ensure they are able to participate in both domestic and regional markets. This often requires a regional approach to facilitate complementarities between countries.

The combination of hard infrastructure and services can facilitate the creation of more inclusive value chains that maximise linkages to domestic economies. High-quality, accessible and efficient trade logistics services, for instance, are crucial to the effective functioning of value chains (this is discussed further in Chapter 4). In some cases, efficient trade logistics services can also play a supporting role in facilitating the effective pass-through of the benefits of regional integration to small producers, by enabling them to benefit from higher mark-ups and product prices and better access high-quality inputs for production.

Finally, these initiatives can be supported by the development of regional standards, albeit set at an appropriate level of stringency. Setting of standards to an appropriate level of stringency will require both consultation and assessment of the constraints and needs from both the supply and the demand side throughout the value chain.

Policy suggestions from cluster 3

This chapter presented new evidence that regional infrastructure is important for firm productivity. Not only do regional exporters have higher productivity than other firms but also they experience greater productivity growth. Furthermore, the productivity-enhancing effects of regional infrastructure do not come only from the exporting side – the overall effects of regional infrastructure on firm-level productivity can work through both exporting and importing. Firms in countries with better regional infrastructure (reflected in the quality of infrastructure in their neighbours) also have relatively higher productivity. This suggests investments in regional infrastructure have long-lasting effects on firm productivity.

We also provide evidence of significant variation in transaction costs associated with the use of regional infrastructure. These costs can vary markedly between regional infrastructure in different areas, but also across different types of firms using the same regional infrastructure facilities. This suggests it is not just the quality of regional hard infrastructure such as roads and ports that influences trade costs and firm productivity, but that other factors are present that impact on the transaction costs of trade, the capacity of firms to trade and, ultimately, their productivity. These factors include regulatory barriers that affect the efficiency of trade logistics services and compromise the effectiveness of regional infrastructure facilities, thereby serving to raise trade costs.

This points to clear elements of complementarity in the interaction between regional hard infrastructure and soft infrastructure in reducing trade costs (Portugal-Perez and Wilson, 2012). Therefore, policies designed to improve the efficiency of trade logistics services and other aspects of soft infrastructure both within and between countries can serve as important mechanisms for unlocking the trade-inducing benefits of improvements in regional infrastructure. With this in mind, we suggest the following complementary policies and initiatives.

Eliminate discriminatory regulations in the transport and freight sectors that prevent foreign service providers from operating in domestic markets. The presence of foreign logistics firms in these sectors can help boost the

availability, quality and efficiency of transport and freight services. Policies to eliminate discriminatory regulations should be targeted in particular at removing the following forms of localisation barriers:

- Cabotage restrictions that prohibit the carriage of domestic cargo by a foreign operator and enable local transport operators to monopolise maritime, aviation and road transport services in certain territories;
- Cargo reservation schemes that require portions of international cargo to be carried by national flag vessels;
- Third country rules that prohibit trucks from a third country from transporting goods between two other countries;
- Restrictions on reciprocal access that prevent trains or trucks from passing through particular territories along key transport routes.

Remove more general localisation barriers that cut across multiple logistics sectors and shield domestic logistics service providers from foreign competition. These include restrictions on the total value, type or number of logistics services that foreign firms may provide and regulations that prohibit foreign firms from obtaining operating licences to perform specific functions. A more substantial presence of foreign logistics firms in domestic and regional markets can help boost competition in individual logistics industries and, in this way, improve the availability, quality and efficiency of trade logistics services.

Revisit efforts to harmonise cross-country standards and regulations affecting trade logistics services. This can be most easily achieved at the regional level.

- In many regions, cross-border trade continues to be hampered by a lack of standardisation of customs processes and other administrative procedures across countries. Inconsistencies in the application of customs laws and procedures both between and within countries are also problematic. In some cases, this is exacerbated by a lack of coordination and poor cooperation across border agencies or between different departments, which generates inefficiencies through the duplication of efforts. In almost all settings, there remains considerable scope to develop policies that harmonise customs processes and procedures between countries at the regional level.
- In other cases, there is a need to improve the implementation of existing harmonisation policies. For instance, it is necessary to accelerate efforts to standardise axle load limits across countries in SADC and in West Africa. Full harmonisation of axle loads limits in these regions would have positive effects in the form of enhanced safety, more efficient transportation of goods across borders, reduced transit times and less damage to road and highway infrastructure in these regions.

Carefully consider the economic impact of specific types of LCRs on individual economies. The primary economic motivation behind LCRs is to localise production by locating the investment or production activities of foreign firms in the domestic market. It is envisaged that this will create jobs and enhance domestic capabilities through the local production of goods and services, and, in some cases, facilitate the transfer of technology and intellectual property from foreign to domestic firms in the sectors in which the LCRs are applied. What is not always considered is the adverse effects these LCRs can have on employment in non-targeted sectors, and more generally on economic diversification, the ability of domestic firms to access intermediate inputs and to integrate into GVCs and overall competitiveness in domestic economies.

Ensure effective access to hard infrastructure. The efficiency of trade logistics services can be undermined by restrictions on access to the critical infrastructure facilities that support the provision of these services. In some cases, the elimination of these restrictions may require the removal of regulations and legislation that prohibit logistics operators from utilising certain facilities (e.g. domestic laws that prevent airlines from operating at foreign airports or regulations that prevent foreign maritime firms from gaining access to government-owned port facilities). In other settings, it may require efforts to improve competition and remove conflicts of interest in the ownership of these facilities. Finally, it may also require upgrades and extensions to existing infrastructure that alleviate congestion problems that undermine the efficiency of the crucial infrastructure services supporting logistics operators.



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Cover photo: TradeMark East Africa, Men pushing a cart full of goods that have been cleared from the Magerwa facility in Gisenyi town.

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