The African Department

A Work in Progress

Integrating Markets for Goods, Labor, and Capital in the East African Community

C. Emre Alper, Wenjie Chen, Jemma Dridi, Hervé Joly, and Fan Yang

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Contributors

The paper was prepared by C. Emre Alper, Wenjie Chen, Jemma Dridi, Hervé Joly (who led the preparation of this paper), and Fan Yang. The authors would like to thank Roger Nord, David Robinson, Axel Schimmelpfennig, the AFR Research Advisory Group members (Aidar Abdychev and Farayi Gwenhamo), and Dr. Pantaleo Kessy (EAC Secretariat) for useful comments and suggestions. They thank Francine Nyankiye for excellent research assistance. All remaining errors are the authors' own.

Overview

The East African Community (EAC) aims to deepen cooperation among its member states in the political, economic, and social domains. The EAC was formally established by Kenya, Tanzania, and Uganda in 2000; Burundi and Rwanda subsequently joined in 2007.[1] Economic and financial integration in the EAC has been supported by several initiatives, including joint protocols and common regulatory frameworks. It is likely to deepen further as new initiatives (for example, regional infrastructure projects) get under way. Three main protocols have underpinned the process of integration: the customs union or CU (C2005), common market or CM (2010)[2], and monetary union protocol (2013). In principle, EAC member countries have pursued economic integration not only for its economic benefits but also as a stepping stone to political integration—the ultimate objective.[3]

The EAC as a whole is among the fastest-growing regions, but there are significant differences across countries. Growth has been strong for many years in most member countries, allowing for a significant increase in living standards.[4] The situation in Burundi, however, has been less favorable, leading to large differences in per capita income across member countries. While agriculture still represents a large share of economic output and exports in all EAC countries, there are significant differences in economic structures.

[1]South Sudan was admitted as a new member state in early 2016. It is not covered in this paper.

[2]See (EAC Secretariat, 2009a).

[3]EAC partner states have a long history of monetary and trade arrangements. As early as 1917, Kenya and Uganda formed a customs union, which the then Tanganyika joined in 1927. After independence, in 1966, the then common currency became fully convertible legal tender in Kenya, Uganda, and Tanzania (see Drummond, Wajid, and Williams 2015 for more detail on the EAC background).

[4]During 2005–11, per capita income growth reached 3.6 percent a year in the EAC, compared with 3.0 percent for sub-Saharan Africa as a whole.

Kenya, Tanzania, and Uganda have had more diversified exports in recent years, for instance (see Drummond, Wajid, and Williams 2015). Kenya has a much more developed financial sector than the other EAC countries (see Appendix I). All countries in the EAC are net commodities importers, but a number of them face the prospect of becoming significant hydrocarbon producers.

This paper assesses the extent of economic and financial integration along a number of dimensions and, where possible, whether integration has increased in the wake of the major regional integration policy milestones. Since the purpose of the common market is to have free movement of goods, capital, and people, the paper focuses on these broad categories. Data availability and quality, however, are often a major limitation. For instance, there is no direct and comprehensive measure of capital flows between EAC countries, and data on labor flows are very scarce. Therefore, the objective of this paper is not to be comprehensive, but to propose a number of stylized facts and quantitative approaches allowing for at least a partial assessment.

Trade integration does not seem to have increased significantly since the implementation of the CU. External tariff rates in EAC countries have decreased significantly between 2000 and 2014, with the average external tariff rates converging to about 12–14 percent, while all EAC member states have reached zero effective tariff rates for intra-EAC trade. However, while intra-EAC trade has grown substantially in nominal terms, the share of intra-EAC imports in total imports has not increased since the implementation of the CU and remains low (single digit). On the export side, intra-EAC trade represents a higher share of total exports (about 20 percent) because the value of total exports is much lower than that of total imports. Gravity equation estimates show that the intensity of bilateral trade within the EAC lags behind that within Asia, America, and Europe even after controlling for size, level of development, culture, and distance. However, intra-EAC trade is more intensive than in any other region in sub-Saharan African, except for the West African Economic and Monetary Union (WAEMU) area.

Labor mobility in the EAC does not seem to have increased significantly either with the implementation of the CM. The analysis of available data on bilateral EAC migration and remittances in this paper shows that (1) significant migration flows occur in EAC countries, (2) these flows are to a significant extent intra-EAC flows, (3) they are more significant for the smaller countries, (4) intra-EAC migration flows do not seem to have increased in recent years, and (5) intra-EAC remittances are low and do not appear to have increased meaningfully following the implementation of the CM.

Financial market integration remains limited, too. There still exist many legislative restrictions on the free movement of capital within the EAC that

inhibit or make entry into the market expensive. While Uganda, Kenya, and more recently Rwanda have achieved a higher degree of capital account openness in the EAC, Tanzania had restrictions on all assets until recently. In the absence of data on intra-EAC capital flows, the application of the beta-convergence and sigma-convergence concepts to financial market returns for various maturities provides an indirect (and imperfect) way to assess financial integration. Empirical estimates point to convergence in short-term market returns within the EAC. Yet, there is no evidence for such convergence in longer-maturity instruments.

Overall, the implementation of the CU and CM do not seem to have led to a major increase in economic and financial integration in the EAC. This paper does not elaborate on the reasons for this empirical result, which could reflect a range of very different issues. For instance, there could be measurement problems, such as the possible misclassification of transit trade or underreporting of cross-border trade in the EAC, which could affect significantly the quality of available data.[5] There could also be exceptional factors at play, such as high hydrocarbon prices during a large part of the period under review or infrastructure investment efforts, both having a large impact on imports from the rest of the world, that could distort the evolution of certain ratios and lead to an underappreciation of the development of intra-EAC trade. Another factor could be the time needed for policies to change existing patterns, and the limited scope of the first phase of CM implementation. However, a number of existing studies have pointed to the incomplete implementation of the CU and CM protocols. For instance, there are still many nontariff barriers affecting intra-EAC trade. The comprehensive assessments ("scorecards") conducted in 2013–14 and 2015–16 by the EAC Secretariat and the World Bank note that laws and regulations of the EAC countries still present barriers to increased cross-border trade and foreign direct investment into the region (EAC Secretariat 2014, 2016). Progress to eliminate restrictions has been slow, and some countries have introduced new measures despite their obligations under the CM. These factors have likely slowed the development of the common market.

[5]Informal cross-border trade between EAC countries is generally thought to be significant but by nature is not well captured in trade statistics.

CHAPTER

1 Analysis of Merchandise Trade Integration in the EAC

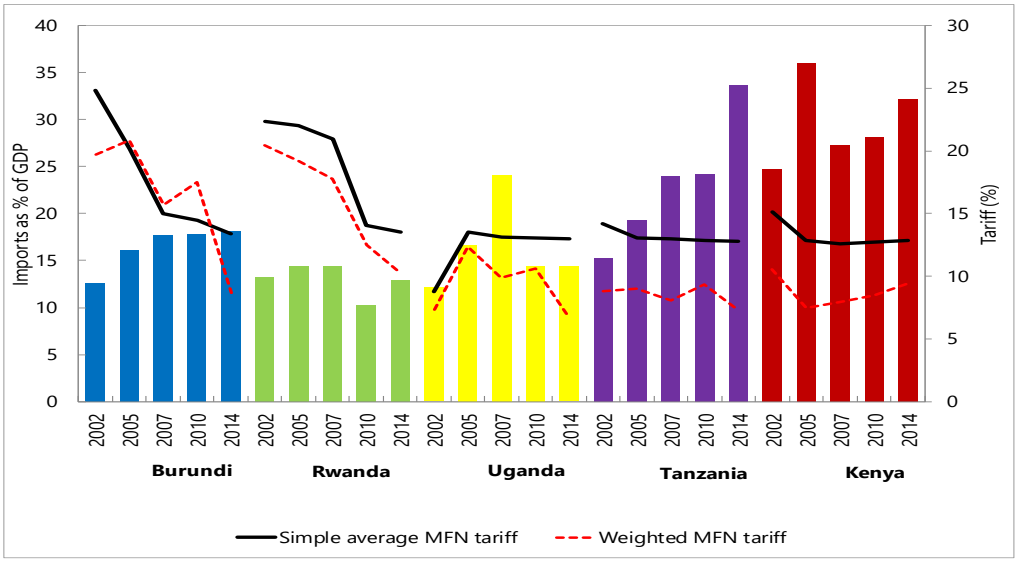
Evolution of Tariffs and Imports of EAC Countries since the Implementation of the CU

The CU is the first integration milestone in the EAC. The EAC member states have agreed to establish free trade on goods and services among themselves, and a common external tariff (CET) applying to goods and services imported from the rest of the world. The EAC CET has three tariff bands and broadly reflects the category of goods: raw materials and capital goods can generally be imported free of duty, intermediate goods generally attract a 10 percent duty, and finished goods a 25 percent duty. Higher rates, ranging from 35 to 100 percent, apply to a number of sensitive items.

Average weighted tariff rates (vis-à-vis the rest of the world) in EAC countries converged rapidly following the establishment of the CU (Figure 1). As countries started from very different tariff levels, their paths to the CET differed significantly. Burundi and Rwanda had to reduce their average weighted tariffs substantially, while Uganda initially had to increase it. For Kenya and Tanzania, the changes were much more limited. The average weighted tariff in all EAC countries has converted to a 12–14 percent range. For most EAC countries, imports from outside the EAC as a share of GDP have increased over the past 15 years.

The analysis focuses on merchandise trade because of data quality and availability issues on services. Aggregate trade data are from the International Monetary Fund (IMF)'s *Direction of Trade Statistics*. Sectoral-level trade and tariff data are from World Bank's World Integrated Trade Solution (WITS) database. Specifically, WITS provide access to sectoral level trade data from the United Nations' *Comtrade* database and tariff data from the UNCTAD Trade Analysis and Information System (TRAINS) database.

Figure 1. Import by EAC Countries from the Rest of the World (ROW) and Tariff Rates



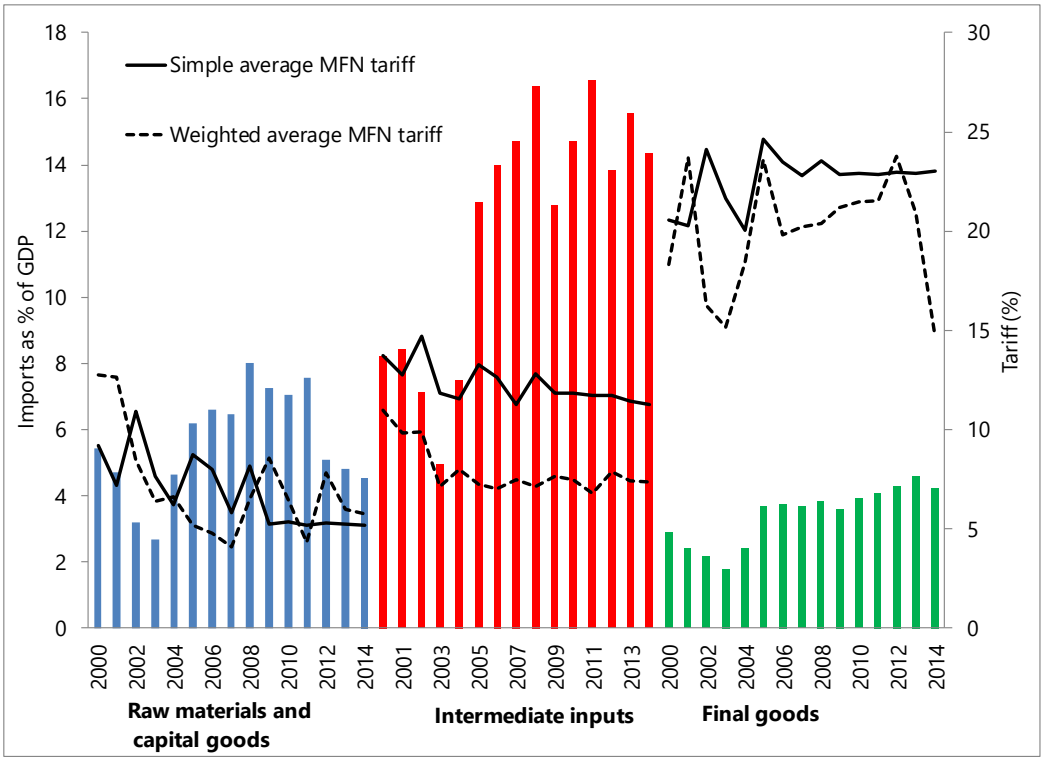
Sources: International Monetary Fund, *Direction of Trade Statistics*; and World Bank, *WITS database*.
Note: MFN stands for most favored nation

Most of the goods imported from outside the EAC are intermediate goods (Figures 2 and 3). The ratio of these imports to GDP has increased over the past 15 years, but this mostly reflects a large increase in oil prices during this period, leading to much higher imports of petroleum products. The imports of industrial supplies have also increased significantly. Raw materials and capital goods constitute the second-largest category of imports from the rest of the world; their ratio to GDP, however, has fluctuated significantly. Final goods have the smallest import share, but their ratio to GDP has increased over the period. Although the average tariff for raw materials and capital goods has declined the most, it is still at about 5 percent, likely reflecting a number of sensitive items exempted from the zero tariff rate. Simple average tariff rates on intermediate and final goods are close to the prescribed rates of the CET, but they have not changed significantly since the early 2000s.

Effectively applied tariff rates[1] within the EAC converged to zero at a fast pace and have remained at this level in recent years (Figure 4). Kenya and Uganda had already liberalized their tariff schedules with respect to all

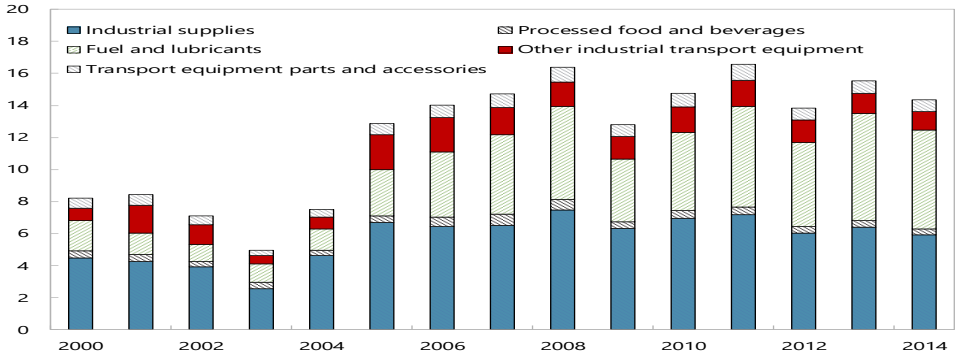
[1]This tariff rate is referred to as the Effectively Applied (AHS) rate in the *WITS database*, usually denoted as the lowest available tariff. This paper also uses "most favored nation tariffs," which are generally applicable to countries that are part of the World Trade Organization (WTO), unless the country is part of a preferential trade agreement, in which case there is the "preferential tariff." In the case of the EAC, because member countries adopted the tariff rates under the trade agreement of the EAC, the formal tariff rates and the effective tariff rates are the same.

Figure 2. EAC Imports from ROW by End-Use



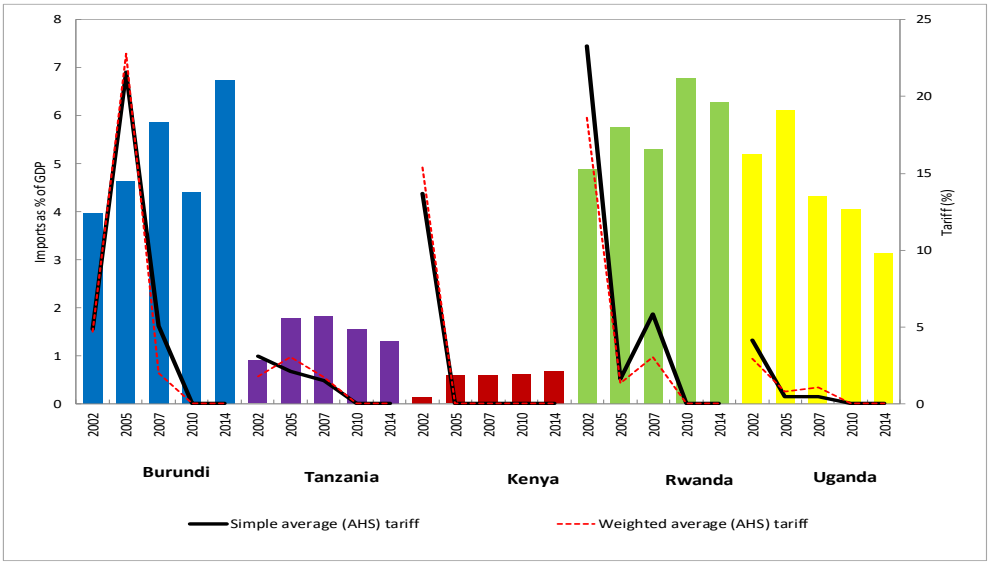
Sources: International Monetary Fund, *Direction of Trade Statistics* and World Bank, *WITS database*.
Note: MFN stands for most favored nation. Raw materials and capital goods include Broad Economic Categories (BEC) sectors 111 (primary food and beverages mainly for industry), 21 (primary industrial supplies), 31 (primary fuels and lubricants), 4 (capital goods except transport equipment and parts and accessories). Intermediate inputs include BEC sectors 121 (processed food and beverages mainly for industry), 22 (processed industrial supplies), 32 (processed fuels and lubricants), 521 (other industrial transport equipment), and 53 (transport equipment parts and accessories). Final goods include BEC sectors 112 (primary food and beverages, mainly for household consumption), 122 (processed food and beverages, mainly for household consumption), 51 (passenger motor cars), 522 (non-industrial transport equipment), 61 (durable consumer goods), 62 (semi-durable consumer goods), and 63 (non-durable consumer goods).

Figure 3. EAC Imports from Rest of the world by Intermediate Inputs (Percent of GDP)



Sources: International Monetary Fund, *Direction of Trade Statistics* and World Bank, *WITS database*.

Figure 4. Imports by EAC Country from EAC Country and Tariff Rates



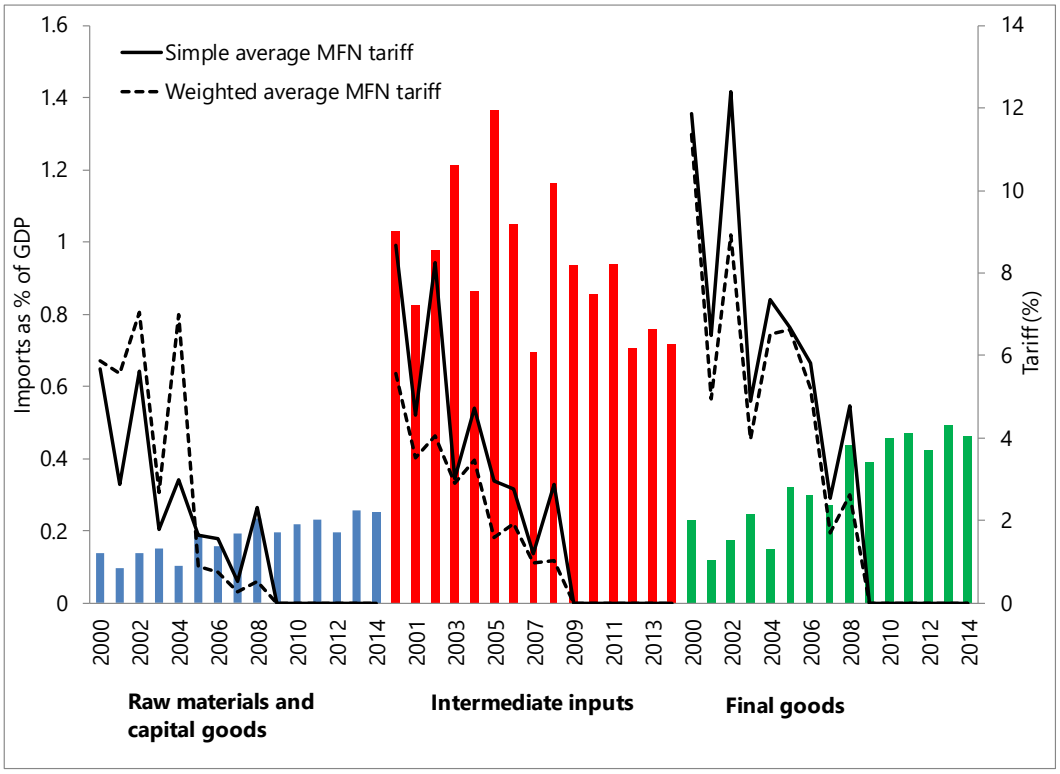
Sources: International Monetary Fund, *Direction of Trade Statistics* and World Bank, *WITS database*.
Note: AHS stands for effectively applied tariffs.

other EAC countries by 2005. All applied intra-EAC tariff rates reached zero in 2009 and have remained at that level since. All countries except Uganda have experienced an increase in intra-EAC imports as a share of GDP from 2002 to 2014—but with significant fluctuations in between and not always clear trends. Ratios to GDP of imports from the EAC are higher for Burundi, Rwanda, and Uganda—three landlocked countries—whereas for Tanzania and Kenya, the import ratios are very small.[2]

Most of the goods imported from within the EAC are also intermediate goods (Figures 5 and 6). They still have by far the largest share of total imports from the rest of the EAC, although this share has decreased in the past 15 years. Within intermediate goods the largest category of imports is industrial supplies, whose share has increased over the past 15 years, unlike that of fuel and lubricants. Final goods, which have seen their average tariff rate drop most during that period, are the category of goods whose ratio to GDP has increased most.

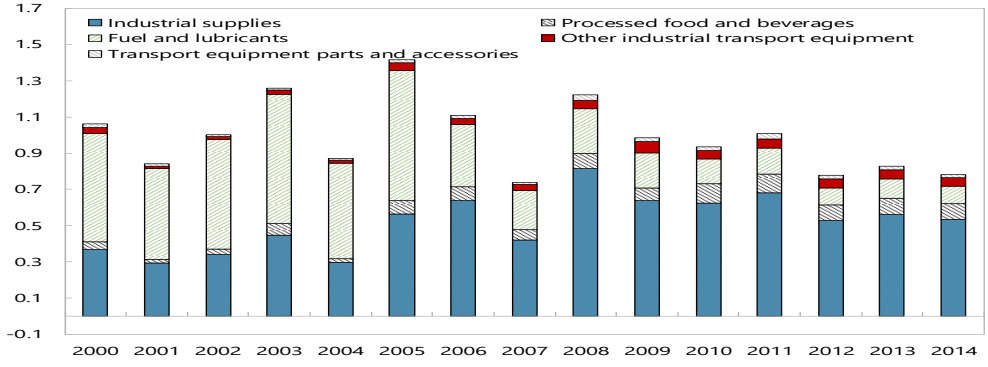
[2]The fact that the ratio of imports from other EAC countries to GDP is much higher in landlocked countries begs the question of the treatment of transit trade. For Burundi, Rwanda, and Uganda, the transit trade may incorrectly appear as imports from Kenya and Tanzania, the two EAC countries with ports and access to the sea, if not recorded properly.

Figure 5. EAC Imports from EAC by End-Use



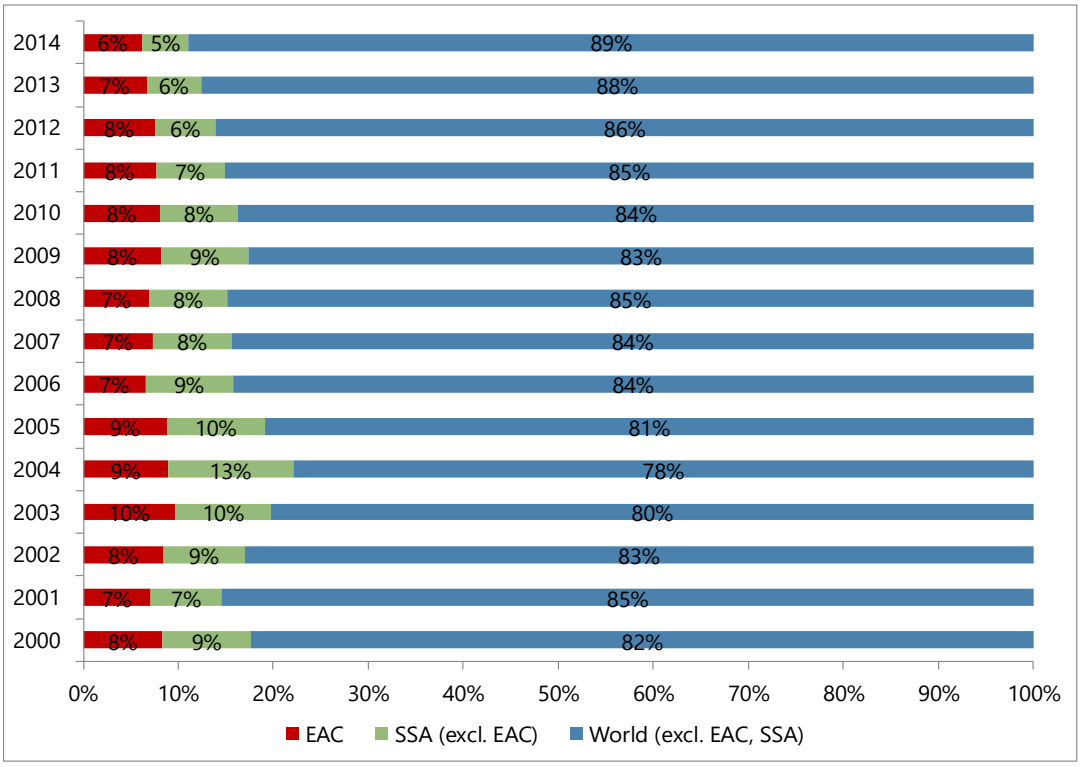
Sources: International Monetary Fund, *Direction of Trade Statistics* and World Bank, *WITS database*.
Note: MFN stands for most favored nation.

Figure 6. EAC Imports from EAC by Intermediate Inputs (Percent of GDP)



Sources: International Monetary Fund, *Direction of Trade Statistics* and World Bank, *WITS database*.

Figure 7. EAC Import Share by Region



Source: International Monetary Fund, *Direction of Trade Statistics*.
Note: SSA = Sub-Saharan Africa.

Evolution of Intra-EAC Trade as a Share of Total Trade

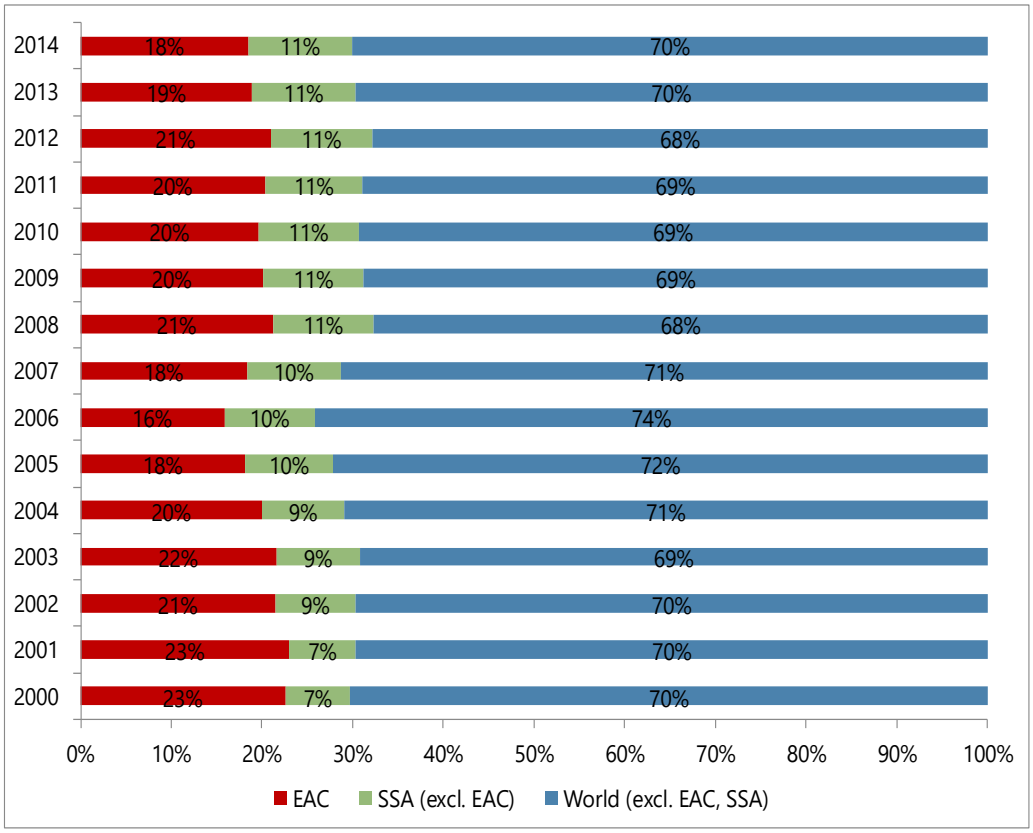
The share of intra-EAC imports in total imports has not increased in the past 15 years, and most imports continue to come from outside sub-Saharan Africa (Figure 7). This share has been relatively stable at about 8 percent over most of the period before recording a small decline in the past two years. The share of imports from the rest of sub-Saharan Africa peaked in 2004 at 13 percent and declined subsequently to 5 percent in 2014, while the share of imports from the rest of the world (excluding sub-Saharan Africa) has recorded a trend increase in the past five years, reaching about 90 percent of the total in 2014. These shares vary considerably, however, across EAC countries, with the larger ones (Kenya and Tanzania) importing relatively little from other EAC countries, unlike Burundi and Rwanda. Uganda's imports from other EAC countries have decreased as a share of its total imports over time (Figure 8).

Figure 8. EAC Import Shares by Origin

Source: International Monetary Fund, *Direction of Trade Statistics*.

In comparison, the EAC and sub-Saharan Africa absorb a much larger, and relatively stable, share of EAC country exports (Figures 9 and 10). This share has fluctuated around 30 percent, with the EAC making about two-thirds of 30 percent. The situation varies across individual EAC countries. The three landlocked countries have increased their share of exports

Figure 9. EAC Export Share by Region



Source: International Monetary Fund, *Direction of Trade Statistics*.

going to other African countries (including EAC ones), unlike Kenya and Tanzania. For the latter two, the increased share of exports to the rest of sub-Saharan Africa has been at the expense of the share of exports to other EAC countries.

Within the EAC, Kenya is the only net exporter (Table 1). Rwanda and Uganda are the largest net importers. Rwanda is emerging as a (small) net exporter to sub-Saharan Africa (excluding the EAC). With the rest of the world outside of sub-Saharan Africa, however, all EAC countries are running large trade deficits.

Figure 10. EAC Export Shares by Destination

Source: International Monetary Fund, Direction of Trade Statistics.

Trade Integration in the EAC Compared with Other Regions

Trade integration appears higher in the EAC than in most other regions in sub-Saharan Africa, but lower than in other regions in the world. Trade integration can be assessed though a "gravity" model, which controls for basic factors thought to influence trade relations, such as the distance separating

Table 1. Trade Balance with the EAC, Sub-Saharan Africa, and the World

Trade balance with EAC (in millions US$)							
Country	2002	2004	2006	2008	2010	2012	2014
Burundi	–22	–49	–55	–78	–84	–131	–194
Kenya	636	772	648	1,076	983	1,208	983
Rwanda	–80	–123	–115	–268	–370	–466	–467
Tanzania	–46	–205	–194	–304	–232	–311	–200
Uganda	–235	–284	–277	–194	–448	–526	–364
Trade balance with SSA — excl. EAC (in millions US$)							
Country	2002	2004	2006	2008	2010	2012	2014
Burundi	–10	–13	–23	–16	–41	–58	–7
Kenya	16	–273	–234	–383	–460	–363	–275
Rwanda	–16	–26	–39	–12	30	30	34
Tanzania	–142	–434	–313	–414	–415	–488	–276
Uganda	–72	–114	–124	–192	–115	–50	–40
Trade balance with world — excl. EAC, SSA (in millions US$)							
Country	2002	2004	2006	2008	2010	2012	2014
Burundi	–67	–66	–293	–239	–282	–428	–412
Kenya	–1,773	–2,385	–4,127	–7,096	–7,041	–11,081	–13,032
Rwanda	–62	92	–218	–469	–365	–549	–645
Tanzania	–612	–1,194	–2,104	–4,942	–4,828	–7,407	–10,941
Uganda	–299	–675	–1,194	–2,418	–1,506	–2,322	–2,265

Sources: International Monetary Fund, Direction of Trade Statistics; and IMF staff calculations.

two countries and the size of their economies (which justify the "gravity" name for this approach), but also the existence of a common language or a shared history.[3] According to this metric, trade integration within the EAC appears to be much lower than in other regions of the world (for example, Asia and Europe) but also significantly higher than in the rest of sub-Saharan Africa over the 2000–13 period. The only region in sub-Saharan Africa that appears more integrated than the EAC is the WAEMU (Table 2).

A more refined approach, trying to control for other factors affecting trade, contributes to explaining the differences in trade integration. When controlling for the rule of law, infrastructure, tariffs, and financing conditions in both exporting and importing countries, the gap in trade inte-

[3]More details on the gravity setup can be found in IMF 2015a, Chapter 2 on "Global Value Chains: Where Are You? The Missing Link in Sub-Saharan Africa's Trade Integration."

gration between EAC countries and those in Asia and Europe falls. The gap with other countries in sub-Saharan Africa is more than explained by these variables. This approach, however, does not allow the role of integration policies (such as the CU) in fostering trade integration in the EAC to be clearly established. Splitting the estimation period in two cannot be done easily,

Table 2. Gravity Estimates

	Dependent Variables: ln(Exports)							
	2000-2013				Post-2009			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Exporter ln (population) (lag1)	1.141***	1.141***	1.273***	1.273***	1.237***	1.236***	1.258***	1.258***
	(0.008)	(0.008)	(0.012)	(0.012)	(0.009)	(0.009)	(0.013)	(0.013)
Importer ln (population) (lag1)	0.987***	0.987***	1.102***	1.102***	1.013***	1.014***	1.111***	1.112***
	(0.008)	(0.008)	(0.011)	(0.011)	(0.009)	(0.009)	(0.012)	(0.012)
Exporter ln (GDP per capita) (lag1)	0.882***	0.882***	0.681***	0.684***	1.138***	1.143***	0.701***	0.705***
	(0.014)	(0.014)	(0.027)	(0.027)	(0.015)	(0.015)	(0.030)	(0.030)
Importer ln (GDP per capita) (lag1)	0.792***	0.793***	0.675***	0.674***	0.857***	0.858***	0.627***	0.625***
	(0.011)	(0.011)	(0.021)	(0.021)	(0.012)	(0.012)	(0.022)	(0.022)
Log of distance (lag1)	-1.376***	-1.379***	-1.293***	-1.300***	-1.425***	-1.434***	-1.266***	-1.272***
	(0.027)	(0.027)	(0.032)	(0.032)	(0.030)	(0.030)	(0.033)	(0.033)
Common official language (lag1)	0.579***	0.564***	0.397***	0.398***	0.584***	0.556***	0.473***	0.477***
	(0.072)	(0.072)	(0.097)	(0.096)	(0.079)	(0.079)	(0.100)	(0.099)
Common language (lag1)	0.515***	0.521***	0.409***	0.401***	0.513***	0.535***	0.312***	0.302***
	(0.074)	(0.074)	(0.099)	(0.098)	(0.081)	(0.081)	(0.102)	(0.101)
Common colonizer (lag1)	0.808***	0.785***	0.851***	0.803***	1.030***	0.997***	0.862***	0.802***
	(0.061)	(0.061)	(0.086)	(0.087)	(0.069)	(0.069)	(0.087)	(0.088)
Exporter landlocked (lag1)	-0.659***	-0.656***	-0.521***	-0.524***	-0.664***	-0.661***	-0.521***	-0.526***
	(0.041)	(0.041)	(0.055)	(0.055)	(0.047)	(0.047)	(0.058)	(0.058)
Importer landlocked (lag1)	-0.805***	-0.809***	-0.708***	-0.715***	-0.885***	-0.890***	-0.717***	-0.724***
	(0.039)	(0.038)	(0.050)	(0.050)	(0.044)	(0.044)	(0.052)	(0.052)
Both Asia and Pacific (lag1)	1.314***	1.315***	0.539***	0.548***	1.389***	1.387***	0.497***	0.513***
	(0.099)	(0.099)	(0.111)	(0.111)	(0.104)	(0.104)	(0.116)	(0.116)
Both Europe (lag1)	1.029***	1.022***	0.298***	0.302***	0.671***	0.646***	0.175*	0.187*
	(0.076)	(0.077)	(0.093)	(0.093)	(0.085)	(0.085)	(0.097)	(0.097)
Both Middle East and Central Asia (lag1)	-0.584***	-0.583***	-0.319**	-0.317**	-0.802***	-0.808***	-0.511***	-0.507***
	(0.109)	(0.109)	(0.154)	(0.155)	(0.124)	(0.124)	(0.167)	(0.168)
Both North and Latin America (lag1)	0.507***	0.508***	1.236***	1.229***	0.595***	0.586***	1.233***	1.226***
	(0.087)	(0.087)	(0.112)	(0.112)	(0.096)	(0.096)	(0.116)	(0.116)

Table 2. Gravity Estimates (Concluded)

	Dependent Variables: ln(Exports)							
	2000-2013				Post-2009			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Both Sub-Saharan Africa, not in EAC (lag1)	-0.430***		0.313**		0.041		0.372**	
	(0.099)		(0.152)		(0.118)		(0.155)	
Both Sub-Saharan Africa, not in RTA(lag1)		-0.345***		0.414***		0.192		0.483***
		(0.104)		(0.159)		(0.125)		(0.162)
Both CEMAC (lag1)		-0.050		1.597		-0.834		1.812
		(0.453)		(2.276)		(0.532)		(2.282)
Both SACU (lag1)		-0.306		-0.884*		-0.613		-0.952**
		(0.524)		(0.469)		(0.449)		(0.458)
Both WAEMU (lag1)		1.076***		1.321***		1.182***		1.378***
		(0.328)		(0.498)		(0.342)		(0.499)
Exporter rule of law (lag1)			0.451***	0.437***			0.410***	0.393***
			(0.039)	(0.039)			(0.043)	(0.043)
Importer rule of law (lag1)			0.183***	0.183***			0.226***	0.227***
			(0.035)	(0.035)			(0.037)	(0.037)
Exporter Infrastructure (lag1)			0.257***	0.259***			0.294***	0.298***
			(0.021)	(0.021)			(0.023)	(0.024)
Importer Infrastructure (lag1)			0.168***	0.169***			0.196***	0.197***
			(0.021)	(0.021)			(0.023)	(0.023)
Exporter ln(tariff) (lag1)			-0.079***	-0.078***			-0.067***	-0.065***
			(0.009)	(0.009)			(0.010)	(0.010)
Importer ln(tariff) (lag1)			-0.065***	-0.065***			-0.076***	-0.077***
			(0.011)	(0.011)			(0.011)	(0.011)
Exporter ln (domestic credit) (lag1)			0.142***	0.133***			0.220***	0.206***
			(0.034)	(0.034)			(0.039)	(0.039)
Importer ln (domestic credit) (lag1)			0.204***	0.205***			0.234***	0.234***
			(0.029)	(0.029)			(0.034)	(0.034)
Observations	271346	271346	54997	54997	100766	100766	37408	37408
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	No	No	No	No	No
R-squared	*0.654*	*0.6546*	*0.7398*	*0.7411*	*0.6593*	*0.6605*	*0.7395*	*0.7411*

Robust standard errors in parentheses

Source: IMF staff calculations.

Notes: CEMAC= Central African Economic and Monetary Community
SACU= Southern African Customs Union
WAEMU= West African Economic and Monetary Union

because the implementation of the CU has been progressive.[4] A recent study by Mayer and Thoenig (2016) using a General Equilibrium Trade Impact (GETI) procedure that combines gravity regressions with general equilibrium simulations found that the CU has significantly increased bilateral trade among members.

Nontariff Barriers (NTBs) to Trade in the EAC

Despite the legal compliance of all partner states with the EAC tariff schedule, there is continued use of tariff-equivalent measures and NTBs (EAC Secretariat, 2016). Moreover, countries continue to face difficulties with the nonrecognition of their EAC certificates of origin. Partner states have resolved some of the NTBs identified as barriers to regional integration in the first CM Scorecard. With regard to new NTBs, Kenya performed best, resolving 60 percent of the NTBs reported against it. For other countries, the rate of resolution was at about half of the reported NTBs. The EAC average time it took to resolve NTBs between the 2014 and 2016 CM Scorecards declined from 24 to eight months. However, a number of unresolved NTBs have persisted since 2014, which include the lack of harmonization of the working hours for customs authorities, lack of coordination among institutions involved in testing goods, and lack of harmonization of road tolls.

[4]Table 2 shows the results for 2009–13 compared with the results for the whole period. They suggest that the EAC integration gap with Europe has decreased over recent years, but also that the EAC's edge over the rest of Africa has disappeared. Due to lack of data for many sub-Saharan African countries, the gravity model estimations do not include a measure of industrialization.

CHAPTER

2 Labor Migration and Remittances in the EAC

The CM is the second regional integration milestone of the EAC. The EAC partner states are expected to maintain a liberal stance toward the movement of goods, services, labor, and capital, and toward the right of residence and establishment. Underlying the EAC CM are a number of key operational principles, such as nondiscrimination of nationals of other partner states on grounds of nationality.

The free movement of workers within the EAC is guaranteed by Article 10 in the CM protocol, but Annex II reduces its scope in the first phase of implementation. Article 10 grants workers the right to apply for employment and consent to job offers, guarantees them unrestricted movement within the partner states and nondiscrimination in national labor markets, and outlines their entitlements within the borders of the member states for employment. It gives the workers the right to stay in the country of a member state for employment, in agreement with the national laws and administrative measures governing the employment of workers of that member state, and to enjoy the freedom of association and collective bargaining for better working conditions and pay in accordance with the countrywide laws of the receiving state. Article 10 also reflects partner states' binding commitment to create an environment that allows EAC citizens to move between different national labor markets for the purposes of providing services. However, the framework for implementation of Article 10 in Annex II of the CM protocol (EAC Secretariat, 2009b) is more restrictive. The schedule for the free movement of workers under Annex II clearly states the free movement of highly skilled workers,[1] for which partner states committed to remove

[1]These include administrators and managers (such as managing directors, executive secretaries, university vice chancellors, finance managers, planning and development managers, production and operations managers), professionals (such as civil/industrial/production/mechanical engineers, medical doctors, higher education

barriers by end-2015.[2] Semi-skilled and unskilled workers and public sector employees, however, are not covered by commitments.

The free movement of workers remains hindered by a number of other obstacles.[3] These include (1) weak provisions for mutual recognition of professional qualifications and experience, despite notable differences between educational systems in member states; (2) complex procedures for obtaining work permits; (3) concerns, in some member states, that lifting all barriers to EAC workers' mobility would allow citizens from other member states to take away jobs from local citizens; (4) language, especially in countries where the command of English is limited; and (5) the uneven quality of training institutions to provide education and certification that is considered adequate by regional standards.

This section focuses on progress in eliminating restrictions to labor mobility and then on recent trends in migration and remittances to assess labor mobility. Even for these variables, the analysis is constrained by data availability and quality issues. National manpower surveys are irregular and incomplete and, as a result, there is a lack of data on stock of skills, characteristics, distribution, and skill supply and demand (EAC Secretariat 2012). While the situation may have improved in the past three years, data timeliness and accuracy remain an issue for the analysis of migration and remittance flows. Another major constraint is the estimation of payment flows sent via informal channels.[4]

Progress in Eliminating Legislative Restrictions to the Movement of Workers in the EAC

Partner states have not fully aligned their national laws with the CM requirement that guarantees the right of EAC citizens to move freely and

teachers, system analysts, lawyers, performing artists, musicians), and craft and related trade workers (such as air traffic and ship controllers and technicians and metal, machinery, and related trade workers).

[2]The following are partner states commitments to remove barriers by end-2015: Burundi – Professionals – by 1st July 2010; Kenya – Managers, Professionals, Technicians and Associate Professionals, and Craft and Related Trades Workers – by 1st July 2010; Rwanda – Professionals and Technicians and Associate Professionals –by 1st July 2010; Tanzania – Professionals and Technicians and Associate Professionals— ranging from by 1st July 2010 to 2015; Uganda – Managers, Professionals and Craft and Related Trades Workers—by 1st July 2010.

[3]See, for example, the annual report of the African Development Bank (2014) and Basnett (2013).

[4]For instance, money transferred in cash or via other means between friends, family members, or community members. According to Freund and Spatafora (2005), the proportion of informal transfers to sub-Saharan Africa could represent between 45 and 65 percent of formal flows. A World Bank (2006) study indicated that only a quarter of central banks in the sample collected data on informal transfers via the use of special inquiries, by questioning either migrants upon return to their country, or recipient households.

to establish residence in another EAC partner state (Ogalo 2012).[5] CM Protocol Articles 7, 13, and 14 stipulate that EAC citizens are guaranteed the right to reside in any partner state—along with their spouse, dependents, and children—for the purpose of living, visiting, touring, transit, education, training, and working. They also provide the right for citizens to establish their business in any partner state and pursue economic activities in accordance with the national laws of the partner state. This also includes self-employed persons who are free to carry out their work across the region. At the same time, they are all subjected to limitations justified by partner states on the grounds of public policy or public security. Some partner states have complied with these rights and freedoms. For instance, the Kenyan and Rwandan governments have made some improvements, including "waiving off the work permit fees for EAC citizens" (Ogalo 2012) to allow free movement of labor and persons, and those two governments have repealed their immigration laws. However, Burundi, Tanzania, and Uganda have not repealed their respective citizenship and immigration laws in conformity with the CM.

The EAC CM Scorecards (2014 and 2016) found that most measures that are inconsistent with commitments to liberalize services trade within the EAC relate to professional services. A review of more than 500 key sectoral laws and regulations of the EAC partner states identified 63 measures inconsistent with commitments to liberalize services trade, of which 46 were in the area of professional services. Engineering accounted for 16 cases of noncompliance, legal services for 14, accounting services for 10, and architectural services for six. The measures were most common in Kenya and Tanzania (11 and 10, respectively), followed by Burundi and Rwanda (nine each), and Uganda (seven). The 2016 Scorecard revealed some progress since 2014, with the number of nonconforming measures (NCMs) in professional services declining to 42. Kenya undertook the most reforms, eliminating three NCMs; Tanzania and Rwanda each eliminated one NCM. However, Uganda had added an NCM in professional services. The remaining NCMs affect the entry and operations of service providers in areas such as licensing, education requirements, restrictions on the number of suppliers, and mandatory membership in professional associations.

The harmonization and mutual recognition of professional and academic qualifications, which has advanced at a slow pace, might be facilitated by a new tool. The East African Qualifications Framework for Higher Education (EAQFHE) was approved in May 2015 (EAC Secretariat 2015).[6] The EAQFHE is a generic instrument for the region and aims to

[5]Common Market Protocol, Articles 7, 13, and 14.

[6]The EAQFHE is the result of joint efforts between the Inter-University Council for East Africa, the East African Business Council, and representatives from partner states.

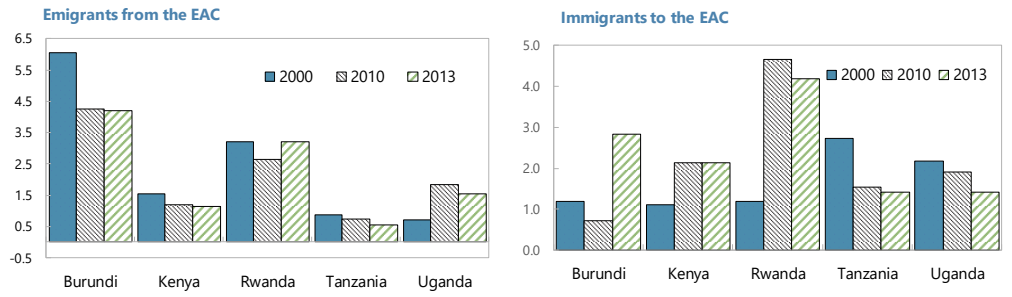
guide the partner states' qualifications frameworks for alignment with the regional framework, so that the regional education and training systems and the qualifications attained are appropriately harmonized. Some professional associations in the region—such as the Engineers' Association, Architects' Association, Medical Doctors' Association, and Lawyers' Association—are also playing a key role in facilitating the mutual recognition of qualifications, by recognizing and accrediting individuals' qualifications and experiences.

Recent Migration and Remittances Trends in the EAC

Migration flows in the EAC, like in the rest of the continent and in other regions, are driven by both economic and social factors. To a large extent, the migration destination is more developed areas, which for an individual migrant means higher income (De Haan 1999). Kenya, Tanzania, and Uganda, which are large and booming economies in East Africa, have attracted the largest number of EAC migrants. Other factors have played an important role in regional migrations, particularly internal conflicts, which have generated large numbers of refugees. As a result of these conflicts, Somalis represent about 60 percent of migrants in Kenya; Congolese, about 50 percent of migrants in Rwanda; and Congolese and South Sudanese, about 45 percent of migrants in Uganda (World Bank 2014).

Migration flows within the EAC increased significantly in the 2000s but have bottomed out in recent years (Figure 11).[7] The number of immigrants

Figure 11. Emigrants from and Immigrants to the EAC
(Percent of each country's population)



Sources: World Bank, *Migration and Remittances Factbook*, 2011–13; and IMF staff calculations.

[7]Migration flows from and to the EAC as a whole remain relatively low. The number of EAC migrants (whether to another EAC country or the rest of the world) is estimated to have increased from about 1.5 million in 2000 to about 2 million in 2013. As there is a rapidly growing population, this represents a decline

in EAC countries coming from another EAC country increased by over 40 percent between 2000 and 2013, and exceeded 1.1 million in 2013. The increase took place in the 2000s, with a slight decrease observed between 2010 and 2013 (Table 3).

EAC countries present different immigration patterns (Tables 4 and 5, Figures 12 and 13). On average, across EAC countries, more than half of EAC emigrants are in another EAC country; 20 percent, in an African country outside the EAC; and the rest, outside Africa. However, the situation differs substantially across EAC countries. Kenyans migrate mostly to North America and Europe. Burundian emigrants are mostly in the EAC, and Rwandan and Ugandan emigrants are mostly in the EAC or the rest of Africa. Geographic proximity seems to be an important factor, perhaps also reflecting cultural and ethnic proximity; Burundians for example migrate mostly to countries that have a border with Burundi, but very few go to Kenya. Emigration patterns also differ with regard to the education level of migrants. Available information suggests that more than 30 percent of Kenyans, Rwandans, and Ugandans with tertiary education levels migrate.[8] Most immigrants in EAC countries are from Africa, including other EAC countries.

Figure 13 visualizes the relative volumes of migration. The three panels describe flows of people in and out of the EAC in two particular years: 2000

Table 3. Estimated Total Migration from, to, and within the EAC

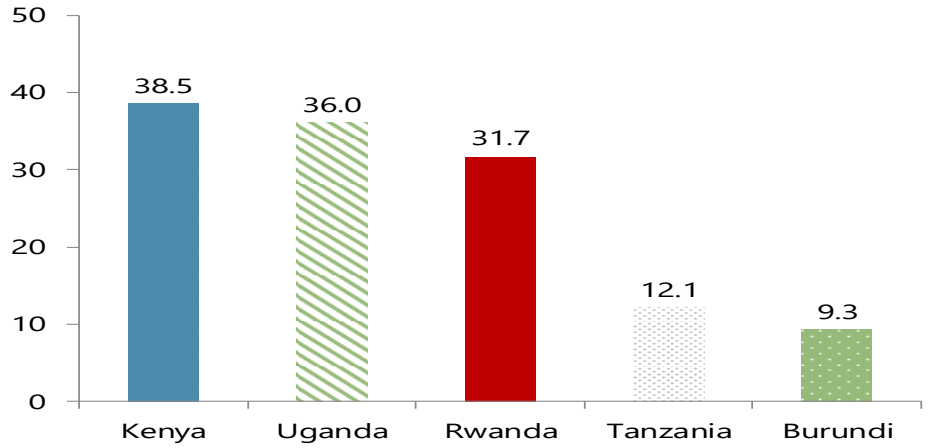
	From the EAC to the rest of the world	From the rest of the world to the EAC	Within the EAC
2000	768,779	1,139,850	774,687
2010	868,999	1,495,370	1,154,377
2013	925,853	1,677,406	1,106,487

Source: World Bank, *Migration and Remittances Factbook*, 2013.

as a share of total population from 1.5 percent in 2000 to about 1.3 percent in 2013, well below the world average migration rate of 3.5 percent. This ratio, however, is much higher for the small landlocked countries in the EAC (Burundi and Rwanda) than the other ones. Immigrants to the EAC number about twice as many as EAC citizens living abroad. The latter are about 800,000, a number that has remained relatively stable between 2000 and 2013, while the numbers of immigrants to the EAC has increased by about 40 percent during that period.

[8]The rate of skilled emigration is the ratio of tertiary-educated emigrants to the population with tertiary education. Data are available only through 2000.

Figure 12. Emigration Rate of Tertiary Educated, 2000
(Percent of total tertiary educated population)



Sources: World Bank; and IMF staff calculations.

Table 4. Emigrants from the EAC by Country of Destination
(Percent of total emigrants)

	EAC		Rest of Africa		Non– African Countries	
	2000	2013	2000	2013	2000	2013
Burundi	81.6	84.3	8.9	9.9	9.4	5.8
Kenya	35.0	22.3	6.2	6.0	58.8	71.7
Rwanda	76.3	45.1	8.6	48.3	15.1	6.6
Tanzania	22.8	51.3	39.1	12.8	38.2	35.9
Uganda	28.6	61.4	8.5	20.8	62.9	17.9
Average EAC	50.2	52.8	13.6	19.1	36.2	28.2

Sources: World Bank, *Migration and Remittances Factbook*, 2011 –13; and IMF staff calculations.

Table 5. Immigrants to the EAC by Country of Origin
(Percent of total immigrants)

	Burundi		Kenya		Rwanda		Tanzania		Uganda	
	2000	2013	2000	2013	2000	2013	2000	2013	2000	2013
EAC	10.3	32.9	12.3	27.3	15.4	48.1	48.9	51.5	52.4	29.9
Other AFR	64.0	58.5	57.3	49.0	80.8	38.8	43.7	24.7	14.5	63.3
Non AFR	25.7	8.6	30.4	23.6	3.8	13.1	7.4	23.8	33.1	6.8

Sources: World Bank, *Migration and Remittances Factbook*, 2011 –13; and IMF staff calculations.

and 2013. The width and color intensity of the arcs/arrows are such that the more people moving between countries, the wider the arcs and darker the color. The data were normalized to be a proportion of total flows in and out of the EAC, not counting flows between countries outside the EAC. In all charts, Somalia was removed from the underlying data as it appeared to be an outlier; keeping it would have severely overemphasized the flows into the EAC from the rest of the world.

The two top panels display some differences. One cannot necessarily infer that these snapshots reflect changing trends, but trends in migration typically do not change much from year to year, absent major geopolitical events.

One might thus be able to conclude that migration into the EAC from the RoW remains low, and flows out to the RoW are still led by Kenyans—although in 2013 there were also a sizable number of flows into Kenya. Flows into the EAC countries are still primarily from other sub-Saharan African countries rather than intra-EAC, although in 2013 the main destination was Uganda rather than Tanzania (dominant target in 2000). Lastly, a large number of Burundians continued to migrate to Tanzania in 2013. These changes can be more aptly summarized in Figure 13.

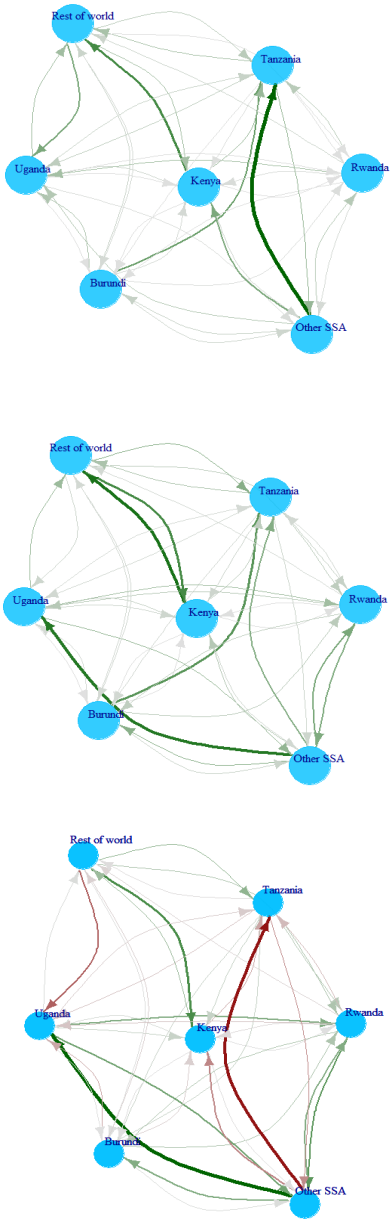
In the bottom panel of Figure 13, the flows are the differences from 2000 to 2013. Green is positive and red is negative change in migration flows; the data are normalized as a proportion of total change. Although their relative volumes are small, intra-EAC flows have mostly increased over the 13 years, particularly into Rwanda.

Intra-EAC remittances have decreased in recent years and represent only a small fraction of the total (about 20 percent; Figures 14 and 15). They amounted to $550 million (or 0.5 percent of regional GDP) in 2013, down from about $650 million in 2010. Remittances from migrants residing in advanced countries are much higher, accounting for about 60 percent of the 2013 total.[9] This likely reflects a number of factors, such as higher income levels in Europe and North America, but also the fact that EAC migrants who reside outside the region are younger and better educated. The average amount of money sent also varies across recipient countries. Kenyan migrants send the highest amount on average, whereas Burundian migrants send the lowest amount.[10]

[9]In 2013, the average migrant from the EAC sent home about $1,312 a year. Migrants residing in the United Kingdom and the United States sent an average US$3,003 and $3,481 a year in 2013, respectively. However, migrants residing in the EAC sent home only about US$500 a year on average (with those in Burundi sending, on average, $360).

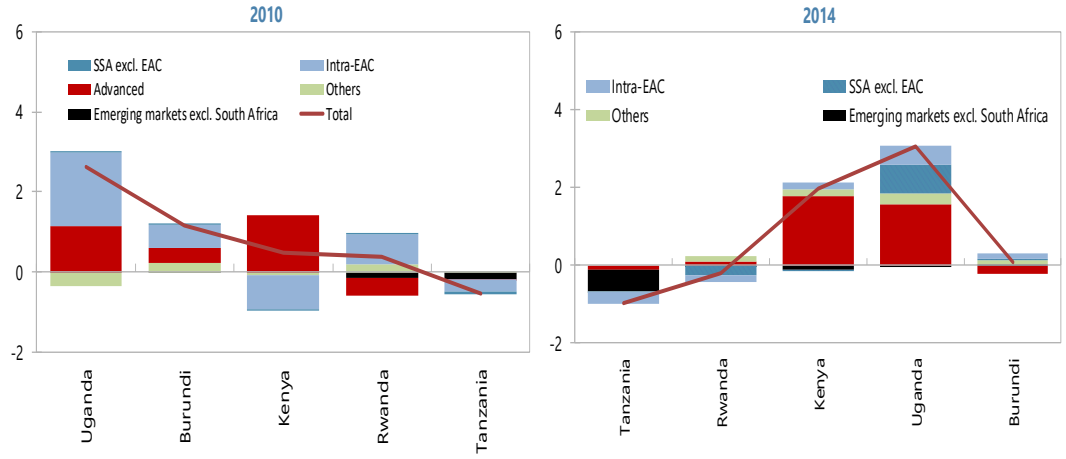
[10]This reflects to some extent different geographic orientations of migration flows, with most Kenyans emigrating to advanced countries and Burundians staying in the EAC and neighboring countries. This could also reflect the fact that most Burundian regional migrants reside in temporary settlements or refugee camps, and their living conditions, combined with the absence of financial infrastructure, likely do not allow them to send money (Fransen and Mazzucato 2014).

Figure 13. Migration in the EAC



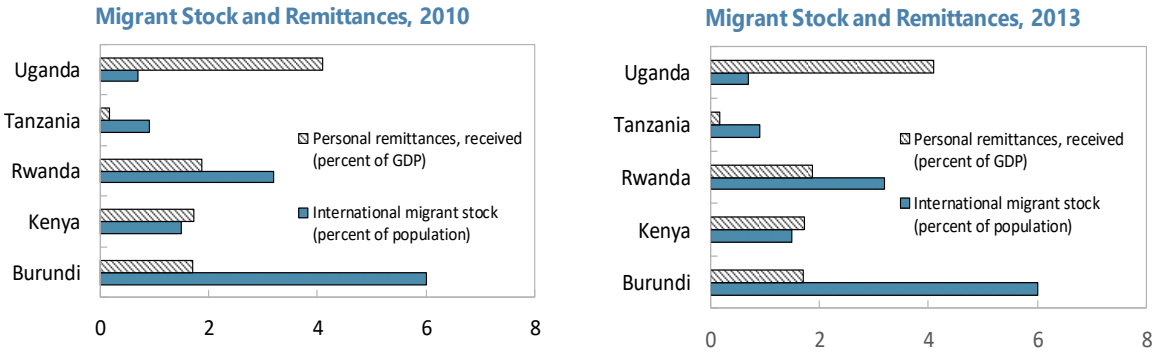
Sources: World Bank, *Migration and Remittances Factbook*, 2011 and 2013; and IMF staff calculations.

Figure 14. Source of Remittance Inflows (Net)
(Percent of GDP)



Sources: World Bank, *Bilateral Migration and Remittances Factbook*, 2011–2014; and IMF staff calculations.

Figure 15. Emigration and Remittances



Sources: World Bank, World Bank Development Indicators; and IMF staff calculations.

CHAPTER

3 Financial Integration in the EAC

The CM protocol requires EAC countries to eliminate restrictions on the free movement of capital. Article 24 of the protocol eliminates capital flow restrictions among the member states based on nationality, place of residence, current payments, and where capital is invested based on securities, credit, direct investment operations as well as personal capital transactions. These are intended to help mobilize capital, bolster competition, facilitate information flows, and improve corporate governance among member states.

This section assesses progress in financial integration since the implementation of the CM. In the absence of comprehensive and reliable information on capital flows between EAC countries, four different (and indirect) approaches are used. First, progress toward eliminating restrictions on the free movement of capital since the ratification of the CM protocol is evaluated. To that end, a summary review of laws and regulations on the movement of capital across the EAC borders is provided, based on the EAC CM Scorecards (2014 and 2016).[1] Second, openness to capital flows is assessed using two capital control indicators, based on de jure information available in the IMF's *Annual Report on Exchange Rate Arrangements and Exchange Rate Restrictions* (AREAER).[2] Third, deviations from the covered interest parity (CIP) condition are analyzed, based on available data on nondeliverable forward market rates (for Kenya, Tanzania, and Uganda). Fourth, convergence in investment returns among securities and debt instruments of various maturities in EAC countries is empirically analyzed.

[1]EAC Secretariat. The 2014 scorecard is available at https://www.wbginvestmentclimate.org/publications/upload/East-African-Common-Market-Scorecard-2014.pdf. The 2016 EAC Common Market Scorecard was released on October 28, 2016.

[2]See Chinn and Ito (2006), Fernandez and others (2015), and IMF (2015b).

Progress in Eliminating Legislative Restrictions in EAC Capital Markets

The EAC CM Scorecards (2014 and 2016) provided comprehensive legislative assessment of capital integration after implementation of the CM protocol. In the five EAC countries, 124 laws and regulations were first reviewed as of end-September 2013 to determine their compliance with Article 24. Of the 20 financial operations considered by the review, 17 were subject to no restrictions in Kenya, 15 in Rwanda and Uganda, and four in Burundi and Tanzania;[3] only two were subject to no restrictions across all five countries (external borrowing by residents and repatriation of proceeds from sale of assets). All EAC countries had restrictions on inward direct investment from other EAC economies. Kenya, Rwanda, and Uganda imposed no restrictions on lending within the EAC by residents (including purchases by residents of EAC shares or securities, credit operations across EAC borders, participation of residents in initial public offerings in other EAC capital markets, and outward direct investments in the EAC). Burundi and Tanzania restricted such EAC lending by residents.

The 2016 Scorecard revealed some progress since 2014. Both Kenya and Uganda adopted a regulatory framework for derivatives and thus removed four of the restrictions recorded in 2014. Uganda also harmonized the tax rate to 20 percent on interest from investment in government securities for both residents and nonresidents. Kenya has met the threshold of no restrictions on the 14 operations measures relating to securities. Uganda also enacted reforms affecting two of the operations but continues to have residency restrictions on the local purchase of shares or other securities of a participating nature. In terms of credit operations, no reforms were recorded with respect to credit operations and restrictions that affect inward investment from other EAC economies.

The Scorecards conclude that overall progress to eliminate legal restrictions on free movement of capital had been sluggish, hindering development of the common market. The review identified many legislative restrictions on the free movement of capital that inhibited entry into the market or made it unduly expensive; uncovered several forms of regulatory discrimination that persisted even after entering the market—such as ceilings on the value of transactions and higher taxes for foreign firms; and noted that some barriers, such as restrictions on personal financial transactions and on the transfer of shares in firms, affected even firms seeking to exit a particular economy. To fully comply with the protocol, EAC partner states need to repeal provisions in at least 27 laws and regulations. Besides existing restric-

[3]Tanzania liberalized its capital account partially in July 2014, allowing nonresidents to participate in the Dar es Salaam Stock Exchange securities and to some limited extent in government securities for EAC residents. These have not been reflected in the EAC Scorecard.

tions, the 2014 Scorecard identified at least 10 new legislative restrictions on free movement of capital in Rwanda, Tanzania, and Uganda since the protocol came into force in 2010.

Openness to Capital Flows in the EAC: A Comparative Perspective

This section analyzes the evolution of capital controls in the EAC based on de jure information from the IMF's AREAER. The aim is to complement the EAC CM Scorecard by analyzing the evolution of capital market controls for a longer period and a larger set of countries in sub-Saharan Africa. Specifically, aggregate capital control indicators from Chinn and Ito (2006) based on the narrative portion of the AREAER are used to analyze recent trends in sub-Saharan Africa.[4] The underlying drivers are examined using a recent data set by Fernandez and others (2015), which covers 100 countries—14 sub-Saharan African countries, of which three are EAC partners: Kenya, Tanzania, and Uganda—and includes disaggregated de jure capital control indicators on inflows and outflows for 10 asset categories.[5]

Uganda, Kenya, and, more recently, Rwanda have had relatively high degrees of financial account openness in the EAC (based on the Chinn-Ito Index; Figure 16).[6] The degree of capital account openness—normalized to range between zero and one, with one indicating no controls—shows a marked increase in openness for the EAC region in the mid-1990s but no significant improvements subsequently, with the exception of Rwanda in the last few years.[7]

The EAC is more open to capital flows than other monetary unions and regional groupings in sub-Saharan Africa. The Common Market for Eastern and Southern Africa (COMESA) is slightly less open than the EAC, but the other groupings are much less so.[8]

[4]The Chinn-Ito index takes the first principal component of the AREAER summary binary codings of controls related to current account transactions, capital account transactions, multiple exchange rate, and the requirements of surrendering export proceeds.

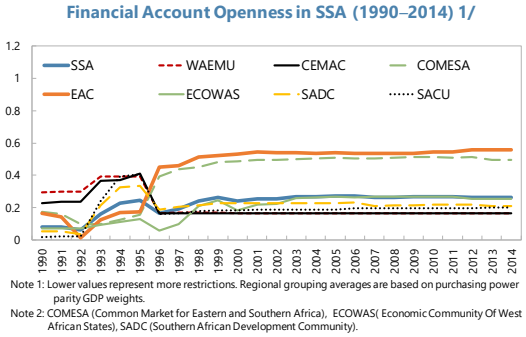
[5]The 10 categories are (i) money market instruments; (ii) bonds or other debt securities; (iii) equity, shares of other securities of a participating nature; (iv) collective investment securities; (v) financial credit and credits other than commercial credit; (vi) derivatives; (vii) commercial credits; (viii) guarantees, sureties, and financial backup facilities; (ix) real estate transactions; and (x) direct investment.

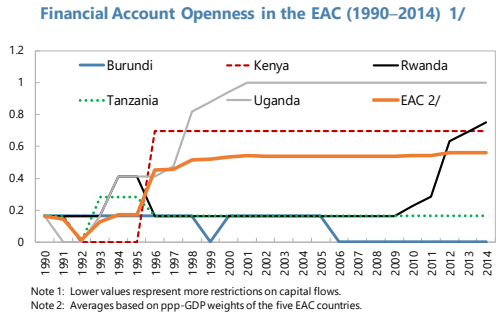
[6]The Chinn-Ito index is not sufficiently nuanced to pick up the limited easing of restrictions on Tanzanian capital accounts in 2014.

[7]The synthetic EAC region is formed from the purchasing power parity (PPP)-GDP weights of the five EAC countries. The weights in 2013 are Burundi, 2.3 percent; Kenya, 36.6 percent; Rwanda, 5.2 percent; Tanzania, 35.1 percent; and Uganda, 20.7 percent.

[8]Kenya, Rwanda, and Uganda are also COMESA members. Other members are Burundi, Comoros, the Democratic Republic of the Congo, Eritrea, Ethiopia, Madagascar, Malawi, Mauritius, Seychelles, Swaziland, Zambia, and Zimbabwe.

Figure 16. Financial Account Openness





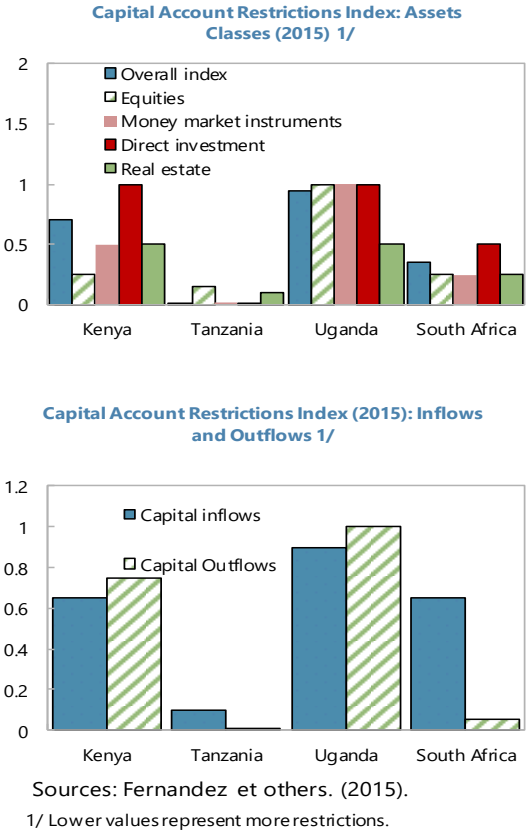
Detailed and disaggregated capital control indices reveal the underlying drivers of these broad trends (based on Fernandez and others 2015; Figure 17). We focus on Kenya, Tanzania, and Uganda from the EAC (based on data availability from 2015 AREAER), and South Africa as a comparator from sub-Saharan Africa. While Kenya and Uganda have slightly lower degrees of restrictions on capital outflows, Tanzania has substantial restrictions on both inflows and outflows.[9] In terms of asset classes, Uganda has no restrictions in any asset category, Kenya has no restrictions on direct investment but some restrictions on other instruments, and Tanzania has significant restrictions on all asset classes, with the exception of equity flows, which have been eased recently. Appendix III provides more detail on this analysis.

An Empirical Assessment of the CIP Condition in Kenya, Tanzania, and Uganda

This section complements the de jure analysis by empirically investigating the interest parity arbitrage in the EAC. Specifically, deviations from the CIP condition among Kenya, Tanzania, and Uganda are examined applying statistical analysis to available data on NDF market rates in the post-2010 period. The magnitude of deviations from the CIP from 2011 to 2015 in each country is then compared to an emerging market comparator in sub-Saharan Africa, South Africa. The presence of capital controls and the unavailability of onshore forward markets necessitate the use of NDF rate data in the analysis. The NDF markets are for frontier and emerging market

[9]In contrast, South Africa restricts mostly capital outflows.

Figure 17. Capital Account Restrictions



Sources: Fernandez et others. (2015).

1/ Lower values represent more restrictions.

economies with substantial cross-border investment and trade flows, where currency convertibility restrictions and capital controls remain (Box 1).

CIP deviations, however, need to be interpreted carefully.[10] The NDF exchange rate does not involve actual capital inflows and transactions in the onshore markets, and the assumptions for the CIP condition to hold are

[10]The absence of liquid foreign exchange market among the EAC currencies and the use of NDF rates necessitate basing the analysis on bilateral exchanges with respect to the U.S. dollar. Implicit forward rates based on the CIP condition for the three EAC countries and South Africa are derived from weekly data from 2011 to 2015 on Treasury Bill (T-Bill) auction yields for three-, six-, and 12-month horizons for Kenya and South Africa, and biweekly data for Tanzania and Uganda; weekly averages of daily secondary market U.S. T-bill rates for three-month, six-month, and 12-month maturities; and weekly averages of daily bilateral daily spot exchange rates with respect to the U.S. dollar. The implicit forward rates for each country and each maturity are then compared with actual NDF rates to derive deviations from the NDF based CIP condition (Annex IV). See also Wang (2010).

Box 1. Nondeliverable Currency Forward (NDF) Markets*

Created in the early 1990s, the NDF contract is a derivative product generally used to hedge exposure or speculate on a move in a currency where local authorities limit such activity. An NDF is similar to a foreign exchange contract, except at maturity the NDF does not require physical delivery of currencies, and is typically settled in U.S. dollars outside the borders of the currency's home jurisdiction ("offshore"). The other currency, usually a frontier or other emerging market economy currency with capital controls, is "nondeliverable." Therefore, NDF prices reflect market expectations and supply and demand factors that cannot be fully manifested in onshore currency product prices in a country with capital controls.

The pricing of NDF contracts, like most forward contracts, is primarily based on the CIP formula. At the settlement date of an NDF contract, if the settlement exchange rate, "the fixing rate"—generally the spot rate traded for the currency onshore—is greater (in foreign currency per U.S. dollar) than the previously agreed forward exchange rate, then the holder of the NDF contract who sells U.S. dollars in exchange for emerging market currency must pay the other side the contract the difference in U.S. dollars. NDF prices, similar to forward exchange contract prices, can be affected by expectations on changes in foreign exchange rate regime, speculative positioning, and conditions on local onshore interest rate markets. When nonresident investors have little or no access to a country's onshore capital markets, the NDF market for that currency is primarily based on the expected future level of the spot exchange rate (for example, interest parity calculations do not affect NDF prices in Chinese yuan given the limited access to onshore Chinese yuan interest rate products.)

The liquidity of the NDF market largely comes from (1) multinational firms and international portfolio managers hedging the exchange rate risk in nonconvertible currencies, (2) nonresidents wishing to speculate on the NDF underlying currency without any exposure to the country, and (3) arbitrageurs who attempt to exploit the differentials in the prices in the two markets without any outlay of capital on their part by two offsetting transactions. Given that NDFs are primarily over-the-counter, rather than exchange-traded, products, it is quite challenging to measure the volume of contracts traded and identify the counterparts and the place where the trade occurs. The Bank for International Settlements Triennial Central Bank Survey in 2013 showed that NDFs constitute a fifth of the global foreign exchange market in outright forwards and a little above 2 percent of overall foreign exchange trading (McCauley, Shu, and Ma 2014).

* See Lipscomb (2005) for a comprehensive overview of the development and characteristics of the NDF market.

unlikely to be met.[11] CIP deviations can therefore reflect a range of things beyond the existence of capital controls.

Descriptive statistics reveal the presence of significant CIP deviations in EAC countries (Table 6 and Appendix IV). In Kenya and Tanzania, the deviations are significant for all maturities. CIP deviations are smaller in Uganda for short maturities (three months) but large for longer maturities. In comparison, CIP deviations are much smaller in South Africa for all maturities.[12]

An Assessment of Financial Market Convergence in the EAC

This section provides evidence on financial market integration based on two complementary convergence concepts. It extends work by Yabara

Table 6. Median Absolute CIP Deviations for Kenya, Uganda, and South Africa 1/
(Percent)

Maturities	3-Month	6-Month	12-Month
EAC			
Kenya	0.49	1.26	3.14
Tanzania	0.45	1.12	2.43
Uganda	0.26	1.04	2.84
SSA comparator			
South Africa	0.05	0.09	0.21

1/ CIP deviations relative to US$ for each country/currency pair.
Sources: Bloomberg; Federal Reserve Bank of Saint Louis; World Economic Outlook database; and IMF staff calculations.

(2012) by using higher-frequency data (weekly and biweekly) over a more

[12]The table shows CIP deviations with respect to the United States. Deviations for each member from a generic EAC country excluding that member were also looked at, using cross-rates. The results did not change (Table A2.3)

recent period. The two convergence concepts—β-convergence and σ-convergence—capture complementary aspects of financial integration.[13] When the dispersion of yields on comparable assets across a group of economies falls over time, σ-convergence occurs. β-convergence measures the extent to which shocks to spreads (the difference between a country's yield on a specific asset and the yield on a benchmark asset) dissipate (Appendix V).

Both β- and σ-convergence analyses point to convergence of short-term market returns within the EAC. Overnight rates provide evidence of β-convergence, except in Rwanda. Weekly stock market returns also exhibit β-convergence for all EAC countries (with the exception of Burundi, which does not have a stock market). The half-life of deviations suggests quite rapid convergence in stock market returns (half a week) following a shock, and slower convergence in overnight market rates (two weeks in Kenya to 11 weeks in Burundi, and 5 to 9 percent on average). The dispersion of spreads for overnight rates and stock market returns also tends to decrease over time, providing evidence of σ-convergence.

There is little evidence, however, of β- and σ-convergence for longer-maturity instruments. β-convergence occurs for Kenya's spreads for three-, six-, and 12-month maturities; Tanzania's spreads for three- and six-month maturities; and Burundi's and Uganda's spreads for the 12-month maturity only. There is no evidence of β-convergence in Rwanda for these maturities. Nevertheless, half-lives of deviations for longer maturities are large, suggesting very slow convergence. Average EAC half-lives are over four months for three-month maturity and over one month for 12-month maturity. There is no evidence for σ-convergence in the EAC for three-, six-, and 12-month maturities.

[13]The former is a necessary but not sufficient condition for the latter. Both concepts must be tracked concurrently for evidence on convergence. See Young and others (2008).

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Appendix I. A Snapshot of Financial Markets in the EAC

Based on market capitalization, turnover ratio, number of listed companies and number of cross-listed companies, the Nairobi Stock Exchange remains by far the most developed equity market in the region, despite the development of the Dar es Salaam Stock Exchange and Uganda Securities Exchange in the past few years (Table A1.1). Government domestic debt markets are also more liquid and diversified in Kenya. Kenya and Uganda show a more diversified government domestic debt holder profile, with the banking sector holding about half of the domestic debt; in Tanzania, Rwanda, and Burundi, the share of the banking sector is in excess of 70 percent of the domestic debt (Tables A1.2–3).

Table A1.1. Stock Market in Kenya, Rwanda, Tanzania, and Uganda
(As of March 30, 2016)

	Kenya	Rwanda	Tanzania	Uganda
Market capitalization (US$ billion)	20.4	3.7	9.8	7.3
Turnover rate	8.51	n.a	2.95	0.19
Number of listed companies	93	6	21	18
Number of companies with RCL [1]	59	…	…	…

[1] Regional cross listing on another EAC stock exchange.

Sources: Stock exchange websites.

Table A1.2. Holders of Government Domestic Debt in the EAC
(As of end-2015)

	Burundi	Kenya	Rwanda	Tanzania	Uganda
	(percent of total domestic debt)				
Banking institutions	87.8	54.8	76.2	69.7	46.0
Pension funds	...	25.7	...	16.1	37.0
Insurance companies	...	8.6	...	7.9	2.0
Others	12.2	10.9	23.8	6.3	15.0

Sources: EAC central banks and finance ministries.

Table A1.3. Domestic Debt in Burundi, Kenya, Rwanda, Tanzania, and Uganda
(As of end-2015)

	Burundi	Kenya	Rwanda	Tanzania	Uganda
Domestic Debt (US$ millions)	675	14,970	526	4,318	3256.0
T-Bill (US$ millions)[1]	...	3,821	274	1,347	1,013
Bonds (US$ millions)	...	10,485	152	2,781	2,243
Domestic Debt (percent of GDP)	23.4	24.4	6.4	9.6	13.2
T-Bill (% of GDP)	...	6.2	3.3	3.0	4.1
Bonds (% of GDP)	...	17.1	1.8	6.2	9.1

Sources: EAC Central banks; and finance ministries.
Note: Treasury bill.

Appendix II. Detailed Information on Migration and Remittance Flow

Table A2.1. EAC Migration Matrix, 2010 and 2013

Source country	Burundi	Kenya	Rwanda	Tanzania	Uganda	Total
Destination country						
Burundi	...	0	33,540	7,609	0	41,148
Kenya	0	...	0	92,527	288,455	380,982
Rwanda	44,785	0	0	6,037	20,737	71,559
Tanzania	151,313	91,146	49,536	...	30,110	322,103
Uganda	101,826	41,065	123,860	71,833	...	338,584
Australia	0	13,034	315	3,153	2,312	18,815
Belgium	4,991	836	11,498	387	369	18,081
France	1,370	1,064	1,279	654	419	4,786
Italy	90	1,292	1,770	975	2,038	6,164
Germany	740	7,647	1,279	1,546	494	11,705
Sweeden	515	1,763	210	1	22,460	24,949
Canada	4,860	26,164	4,005	23,009	12,811	70,848
The Netherlands	2,698	2,253	1,120	1,449	1,012	8,532
United Kingdom	2,678	152,999	3,143	34,347	54,122	247,290
United States	1,187	85,123	2,614	8,856	22,460	120,240
Other	39,374	32,917	29,473	64,779	171,046	337,589
Total	356,427	457,303	263,641	317,160	628,845	2,023,376

Source country	Burundi	Kenya	Rwanda	Tanzania	Uganda	Total
Destination country						
Burundi	...	916	57,107	24,851	791	83,665
Kenya	2,254	...	3,527	33,015	271,149	309,945
Rwanda	64,198	1,439	...	45,373	106,501	217,511
Tanzania	233,606	59,236	24,947	...	18,524	336,313
Uganda	19,190	44,359	70,411	25,093	...	159,053
Australia	1,971	16,000	631	3,984	3,030	25,616
Belgium	2,655	0	3,805	0	0	6,460
France	1,821	1,695	6,029	612	534	10,691
Italy	812	3,245	661	1,320	891	6,929
Germany	715	9,507	976	1,372	1,943	14,513
Sweeden	2,805	3,263	501	1,640	3,628	11,837
Canada	5,232	26,657	4,338	22,900	12,933	72,060
The Netherlands	2,547	2,808	1,163	1,523	1,292	9,333
United Kingdom	0	145,403	0	31,108	64,223	240,734
United States	456	112,604	825	18,924	19,453	152,262
Other	40,535	48,367	170,903	38,371	77,242	375,418
Total	378,797	475,499	345,824	250,086	582,134	2,032,340

Sources: World Bank, *Migration and Remittances Factbook*, 2011 and 2014.

Table A2.2. Remittances per Migrant, 2010 and 2013

(U.S. dollars)

Remittance receiving	Burundi	Kenya	Rwanda	Tanzania	Uganda	Total
Remitances sending						
Burundi	...	...	292	114	...	259
Kenya	...	...	...	129	1,442	1,123
Rwanda	73	...	...	114	730	267
Tanzania	76	711	307	...	756	355
Uganda	74	711	306	165	...	256
Australia	...	1,816	0	0	2,229	1,532
Belgium	342	1,867	1,046	0	2,298	893
France	0	1,780	2,842	0	2,181	1,346
Italy	0	2,195	868	0	505	876
Germany	0	1,993	957	329	9,454	1,849
Sweeden	0	1,901	0	0	311	414
Canada	341	1,862	0	372	2,291	1,246
The Netherlands	541	1,923	991	0	2,374	1,091
United Kingdom	326	1,796	919	84	2,222	1,625
United States	0	2,087	1,071	316	2,562	2,003
Other	165	1,144	507	229	497	471
Total	97	1,500	391	174	1,221	814

Remittance receiving	Burundi	Kenya	Rwanda	Tanzania	Uganda	Total
Remitances sending						
Burundi	...	1461	422	146	1390	361
Kenya	119	...	468	155	355	333
Rwanda	106	1461	...	146	1412	763
Tanzania	111	1461	445	...	1477	449
Uganda	105	1461	422	146	...	630
Australia	507	3313	1585	502	4290	2733
Belgium	377	...	1314	...	...	929
France	549	0	1161	1634	0	842
Italy	0	3082	1513	0	0	1588
Germany	0	3366	1025	729	0	2343
Sweeden	357	3371	3992	610	4410	2619
Canada	382	3489	1383	393	4330	2304
The Netherlands	393	356	860	657	4644	1071
United Kingdom	...	3136	...	354	3986	3003
United States	0	3774	1212	423	4935	3481
Other	161	2104	459	166	4297	1398
Total	128	2813	492	238	1804	1312

Sources: World Bank, *Migration and Remittances Factbook*, 2011 and 2014; and IMF staff calculations.

Table A2.3. EAC: Remittances by Country of Origin, 2010 and 2013

(Millions of U.S. dollars)

EAC-Remittances by Country of Origin, 2010

Remittance receiving	Burundi	Kenya	Rwanda	Tanzania	Uganda	Total
Remitances sending	Burundi	Kenya	Rwanda	Tanzania	Uganda	Total
Burundi	...	0	10	1	0	11
Kenya	0	...	0	12	416	428
Rwanda	3	0	...	1	15	19
Tanzania	12	65	15	...	23	114
Uganda	8	29	38	12	...	87
Australia	0	24	0	0	5	29
Belgium	2	2	12	0	1	16
France	0	2	4	0	1	6
Italy	0	3	2	0	1	5
Germany	0	15	1	1	5	22
Sweeden	0	3	0	0	7	10
Canada	2	49	0	9	29	88
The Netherlands	1	4	1	0	2	9
United Kingdom	1	275	3	3	120	402
United States	0	178	3	3	58	241
Other	6	38	15	15	85	159
Total	34	686	103	55	768	1,646

EAC-Remittances by Country of Origin, 2013

Remittance receiving	Burundi	Kenya	Rwanda	Tanzania	Uganda	Total
Remitances sending						
Burundi	...	1	24	4	1	30
Kenya	0	...	2	5	96	103
Rwanda	7	2	...	7	150	166
Tanzania	26	87	11	...	27	151
Uganda	2	65	30	4	...	100
Australia	1	53	1	2	13	70
Belgium	1	0	5	0	0	6
France	1	0	7	0	0	8
Italy	0	10	1	0	0	11
Germany	0	32	1	1	0	34
Sweeden	1	11	5	1	16	34
Canada	2	93	6	9	56	166
The Netherlands	1	1	1	1	6	10
United Kingdom	0	456	0	11	256	723
United States	0	425	1	8	96	530
Other	7	102	75	7	332	523
Total	49	1,338	170	59	1,050	2,666

Sources: World Bank, *Migration and Remittances Factbook*, 2011 and 2014.

Table A2.4. Intra-EAC Remittances by Country of Origin, 2010 and 2013

(Millions of U.S. dollars)

Intra-EAC Remittances by Country of Origin, 2010

Remittance receiving	Burundi	Kenya	Rwanda	Tanzania	Uganda	Total
Remitances sending						
Burundi	...	0	10	1	0	11
Kenya	0	...	0	12	416	428
Rwanda	3	0	...	1	15	19
Tanzania	12	65	15	...	23	114
Uganda	8	29	38	12	...	87
Total	22	94	63	25	454	658

Intra-EAC Remittances by Country of O

Remittance receiving	Burundi	Kenya	Rwanda	T
Remitances sending				
Burundi	...	1	24	
Kenya	0	...	2	
Rwanda	7	2	...	
Tanzania	26	87	11	
Uganda	2	65	30	
Total	35	155	67	

Sources: World Bank, *Migration and Remittances Factbook*, 2011 and 2014.

Table A2.5. Total Population in EAC Countries, 2000–14

(Millions)

	2010	2011	2012	2013	2014
Burundi	8.4	8.6	8.8	9.0	9.2
Kenya	38.5	39.5	40.7	41.8	43.0
Rwanda	10.0	10.2	10.5	10.7	11.0
Tanzania	42.8	43.9	44.9	45.8	46.7
Uganda	34.0	35.1	36.3	37.6	38.7
EAC	**133.7**	**137.2**	**141.2**	**145.0**	**148.7**

Source: IMF, *World Economic Outlook*, October 2016.

Appendix III. Capital Account Restrictions: Country-Specific Details

Kenya

- Equities: In terms of residency, EAC investors are treated as local investors. There are no restrictions on purchases; however, issuances abroad by residents require Capital Market Authority (CMA) approval. For nonresidents, there is a regulation to limit foreign investors' share up to 60 percent of the share of a capital of a listed company. Local issuance of securities by nonresidents requires CMA approval in accordance with the Capital Markets Act.

- Money Market Instruments: No controls apply to purchases. However, both residents and nonresidents are subject to Central Bank Kenya approval for issuance of money market instruments (abroad for the former, locally for the latter).

- Bonds: No controls apply to purchases. The issuance of bonds abroad by residents requires CMA approval. For nonresident sales, regulations governing securities of a participating nature apply.

Tanzania

- Equities: Purchases of shares on the DSE by a foreign investor are subject to a limit of 60 percent of total securities issued. Individual investors may not acquire more than 1 percent of an issue, and institutional investors may not acquire more than 10 percent. Investments must be made from securities accounts with local banks to be transferable. A three-month holding period also applies. Foreign companies from prescribed territories (that is, companies from the EAC—Burundi, Kenya, Rwanda, Uganda) may issue securities to the public and be cross-listed at an approved stock

exchange in Tanzania, subject to approval by the Capital Markets and Securities Authority (CMSA).

- Money Market Instruments: Nonresidents (outside EAC) may not hold government securities. Currently, no money market instruments are available. Purchases by residents are allowed only if funded fully by external sources. However, this requirement does not apply if the purchase is within the EAC, and it must be reported to the Bank of Tanzania for statistical purposes.

- Bonds: Nonresidents (outside the EAC) are not permitted to hold government securities. Purchases of bonds on the DSE by a foreign investor are subject to a limit of 60 percent of total securities issued. Individual investors may not acquire more than 1 percent of an issue, and institutional investors may not acquire more than 10 percent. Investments must be made from securities accounts with local banks to be transferable. A three-month holding period also applies. Purchases and redemption of corporate debt securities must be in local currency. Bond purchases by residents are allowed only if funded fully by external sources and must be reported to the Bank of Tanzania for statistical purposes. Sales of bonds abroad by residents are subject to CMSA approval.

Uganda

- Equities: No restrictions

- Money Market Instruments: No restrictions.

- Bonds: No restrictions.

South Africa

- Equities: Approval is required for local purchases by nonresidents. Servicing must be from foreign sources if the funds are used abroad, and from domestic sources if the funds are transferred to South Africa. Effective February 27, 2014, unlisted technology, media, telecommunications, exploration, and other research and development companies may apply to the Financial Surveillance (FinSurv) department of the South African Reserve Bank for approval for primary listing abroad or to raise loans abroad and operating capital. Effective, February 27, 2014, companies listed on the Johannesburg Stock Exchange (JSE) may have a secondary listing and/or list depository receipt programs on foreign exchanges to facilitate local and FDI expansion. Approval is required for foreign entities to list shares

and securities on the JSE Limited. The funds raised by the issuer are freely transferable. All inward-listed shares on the JSE Limited traded and settled in rand are classified as domestic for the purpose of trading on the exchange and are included on the JSE indices; institutional investors may invest in such shares without affecting their foreign exposure limits. Effective April 1, 2015, purchases by resident individuals are allowed within the foreign capital allowance limit of R11mil. for each individual in a calendar year (R1mil. single discretionary allowance plus R10mil. foreign capital allowance) or from the proceeds of any authorized foreign asset. Approval is required for issuances by residents abroad.

- Money Market Instruments: There are no restrictions on local purchases by nonresidents. Approval is required for foreign entities to list money market instruments on the JSE Limited. The funds raised by the issuer are freely transferable. Money market instrument purchases abroad by residents are allowed within the foreign capital allowance limit of R5mil. for each individual in a calendar year (R1mil. single discretionary allowance plus R4mil. foreign capital allowance) or from the proceeds of any authorized foreign asset. South African institutional investors may invest in rand-denominated instruments issued abroad and in instruments issued by South African corporations in the foreign market, subject to foreign portfolio investment allowances. Approval is also required for issuances abroad by residents. Servicing must be undertaken from foreign sources if the funds are used abroad, and from domestic sources if the funds are used in South Africa.

- Bonds: Approval is required for nonresident investors to purchase bonds locally. Approval is required for foreign entities to list bonds or other debt instruments on the JSE Limited. The funds raised by the issuer are freely transferable. Similar to money market instruments, bond purchases abroad by residents are allowed within the foreign capital allowance limit of R5mil. (R1mil. single discretionary allowance plus R4mil. foreign capital allowance) a calendar year or from the proceeds of any authorized foreign asset. Approval is also required for residents to issue bonds abroad. Servicing must be from foreign sources if the funds are used abroad, and from domestic sources if the funds are transferred to South Africa. Effective February 27, 2014, unlisted technology, media, telecommunications, exploration, and other research and development companies may apply to FinSurv for approval for primary listing abroad or to raise loans abroad and operating capital. Effective, February 27, 2014, companies listed on the JSE Limited may have a secondary listing and/or list depository receipt programs on foreign exchanges to facilitate local and foreign direct investment expansion.

Appendix IV. An Analysis of Covered Interest Parity Condition for the EAC

Background

The covered interest parity (CIP) condition is one of the most relied upon indicators of financial market integration and market efficiency. Many models in international finance and open economy macroeconomics assume the CIP condition and use it as a key building block. CIP states that the actions of foreign exchange market participants, when hedged against exchange rate risk using the forward rates, should equalize interest rates on any two assets that differ only in currency of denomination.[1] The CIP condition holds under the following four assumptions: (1) negligible transaction costs, (2) perfect capital mobility, (3) many participants in the spot and forward exchange markets with ample funds and no counterparty risk, and (4) underlying assets having identical political and default risk as well as liquidity, maturity, and seniority.

There has been considerable interest in investigations of whether CIP holds for a variety of currency pairs and asset types.[2] Empirical tests mainly consider larger currencies and support the validity of the CIP condition with the exception of periods characterized by financial turbulence when counterparty risk is especially prevalent.

Algebraically, suppose that $i^{d}_{t,k}$ and $i^{f}_{t,k}$ denote the interest rates on domestic currency and foreign-currency-denominated assets at time t, respectively, for an investment horizon of k. Suppose also that S_t denotes the spot exchange rate at time t—that is, the current price of one unit of foreign currency in domestic currency units—while $F_{t,k}$ is the k-period forward exchange rate at time t—that is, the exchange rate currently agreed upon for a transaction k periods ahead. The CIP condition can be expressed as

[1]See for example, Alper and Ardic (2010).
[2]See Officer and Willet (1970) and Taylor (1992) for comprehensive surveys of this literature.

$$F_{t,k} = S_t \frac{(1 + i^d_{t,k})}{(1 + i^f_{t,k})}$$

The actual k-period forward rate $F_{t,k}$ may be different than the implied forward rate F_{CIP} (right hand side of the equation) when any of the four CIP assumptions above is violated. This study treats violation of any of these assumptions under the general title "financial market impediments" and checks to see whether there are differences among EAC countries, where such markets exist, and compare the magnitude of such deviations to South Africa, a regional comparator. To that end the time series properties of deviations of the actual forward rate from the CIP implied forward rate, Δ, for different investment horizons (k = three, six, and 12 months) vis-à-vis the U.S. dollar are analyzed:

$$\Delta = \frac{F_{t,k}}{F_{CIP}} - 1$$

Data

Daily spot and nondeliverable forward (NDF) market exchange rates per U.S. dollar from 2011 to 2015 for Kenya, Tanzania, and Uganda for the EAC and the sub-Saharan Africa comparator South Africa are from Bloomberg (Figure A4.1).

The interest rate data used to calculate the implicit CIP in this study are three-, six-, and 12-month Treasury Bill (T-bill) auction yields for Kenya, Tanzania, and Uganda from the EAC as well as for South Africa for 2011 through 2015 and are from central bank websites and from Bloomberg. Daily T-bill data for the corresponding maturities for the United States are from Federal Reserve Economic Data. Daily secondary market T-bill rates are not available in any country in the sample. Hence, we rely on weekly auctions for Kenya, Tanzania, and South Africa, and biweekly auctions for Uganda; 364-day T-bill auctions were conducted once a month before March 2013 in Kenya, so the 12-month analysis for Kenya is restricted to the post-March 2013 period.

To derive descriptive statistics on CIP deviations, weekly averages of the daily data of the spot and NDF market exchange rates are calculated for Kenya, Tanzania, and South Africa while biweekly averages are calculated for Uganda. The corresponding maturity average U.S. T-bill yields (weekly and biweekly) are also calculated using daily data. All T-bill yields are available in annualized terms, the three-month implied forward exchange rate by first converting 91-day annualized T-bill yields to three-month yields. Similarly,

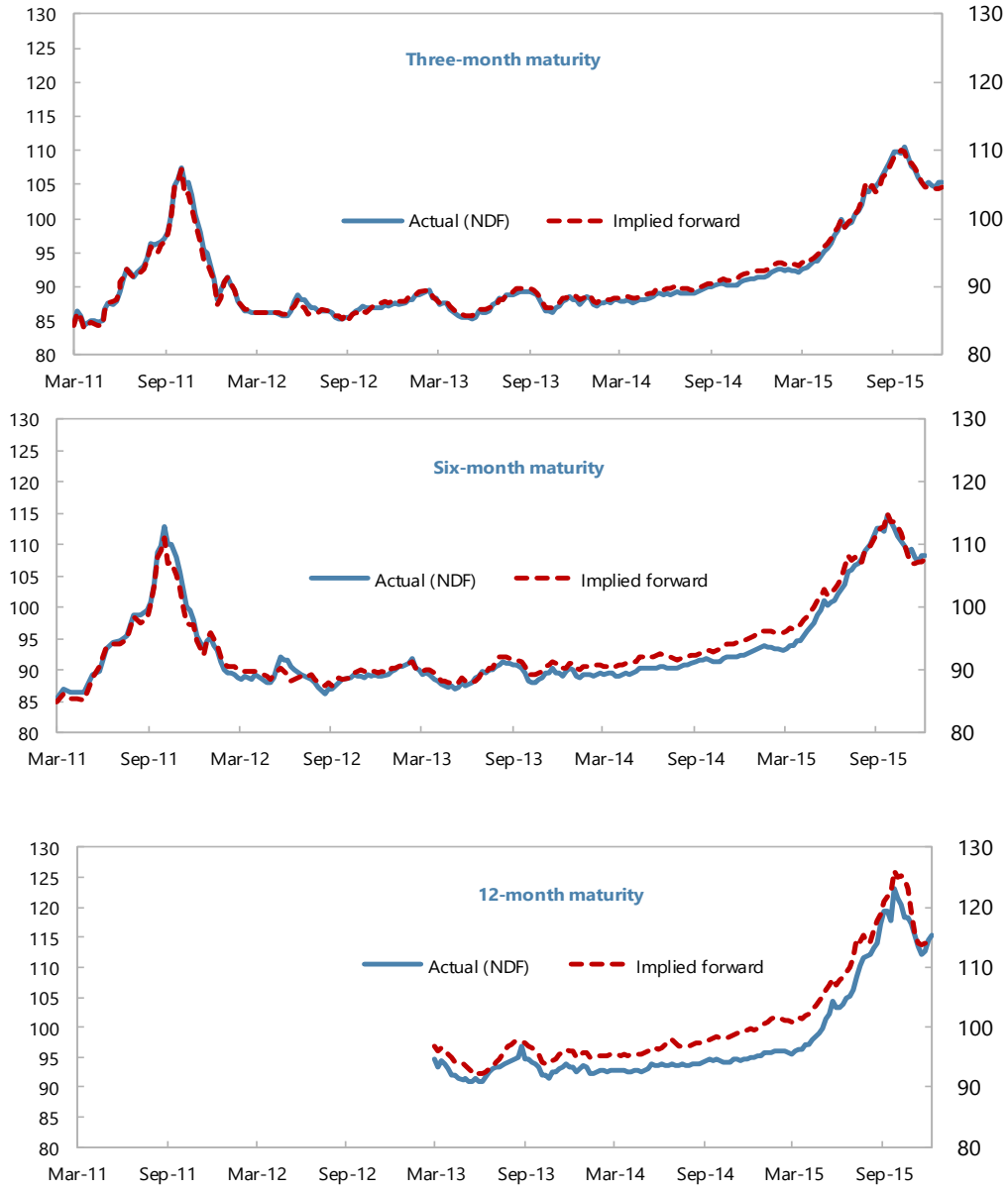
six-month yields are calculated from 182-day annualized T-bill yields. For the 364 days, annualized yields on 12-month T-bill rates are used. The implied CIP and the NDF for three-month, six-month, and 12-month horizons for Kenya, Tanzania, Uganda, and South Africa are plotted in Figures A4.2–5. Tables A4.1–3 provide summary statistics for the CIP deviations and the absolute CIP deviations, respectively.

Figure A4.1. Kenya, Tanzania, Uganda, and South Africa: Spot and NDF Exchange Rates (2011–15)
(National currency per US$)

Source: Bloomberg.

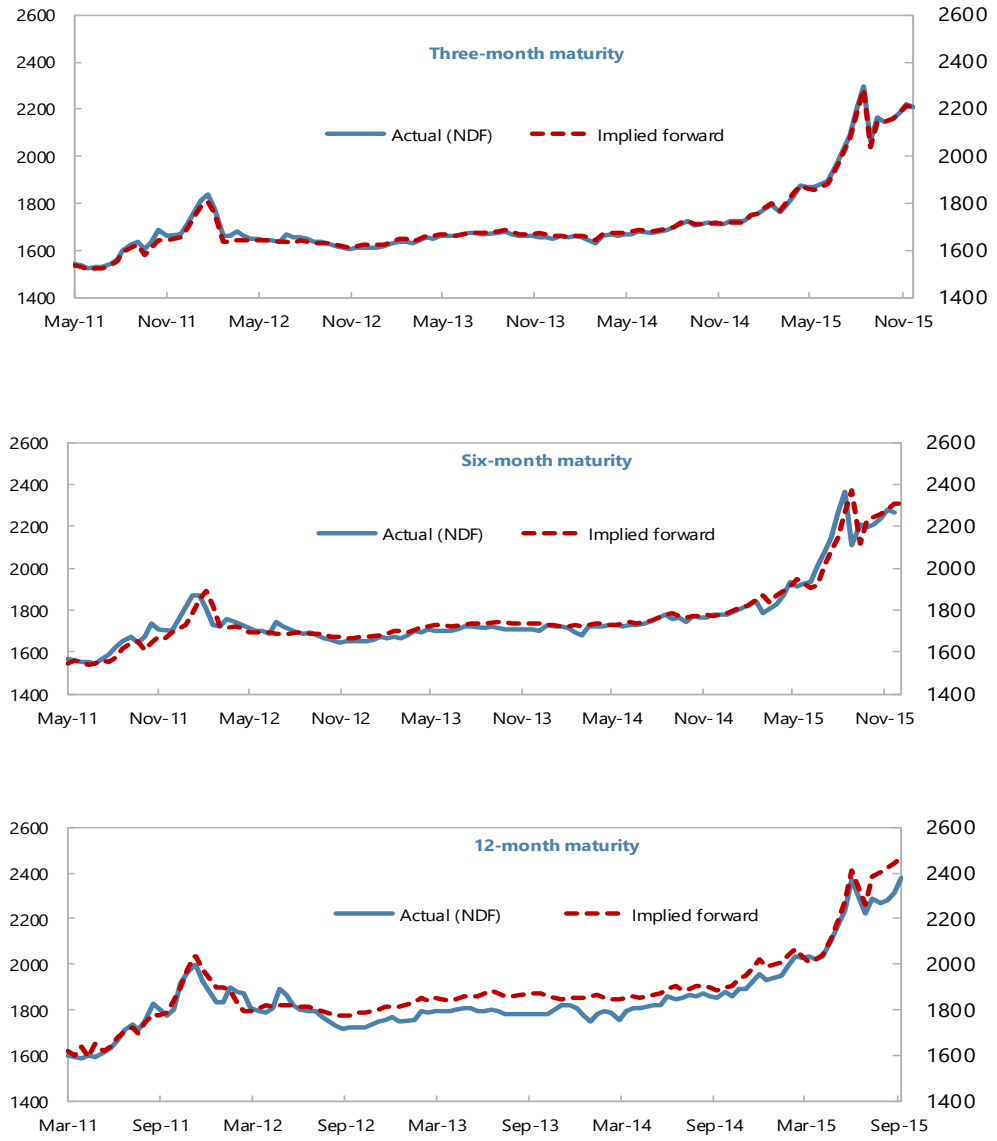
Note: 3m, 6m, and 12m stand for three-month, six-month and twelve-month maturities, respectively

Figure A4.2. Kenya: Actual (NDF) and Implied Forward Exchange Rates (2011–15)
(National currency per US$)



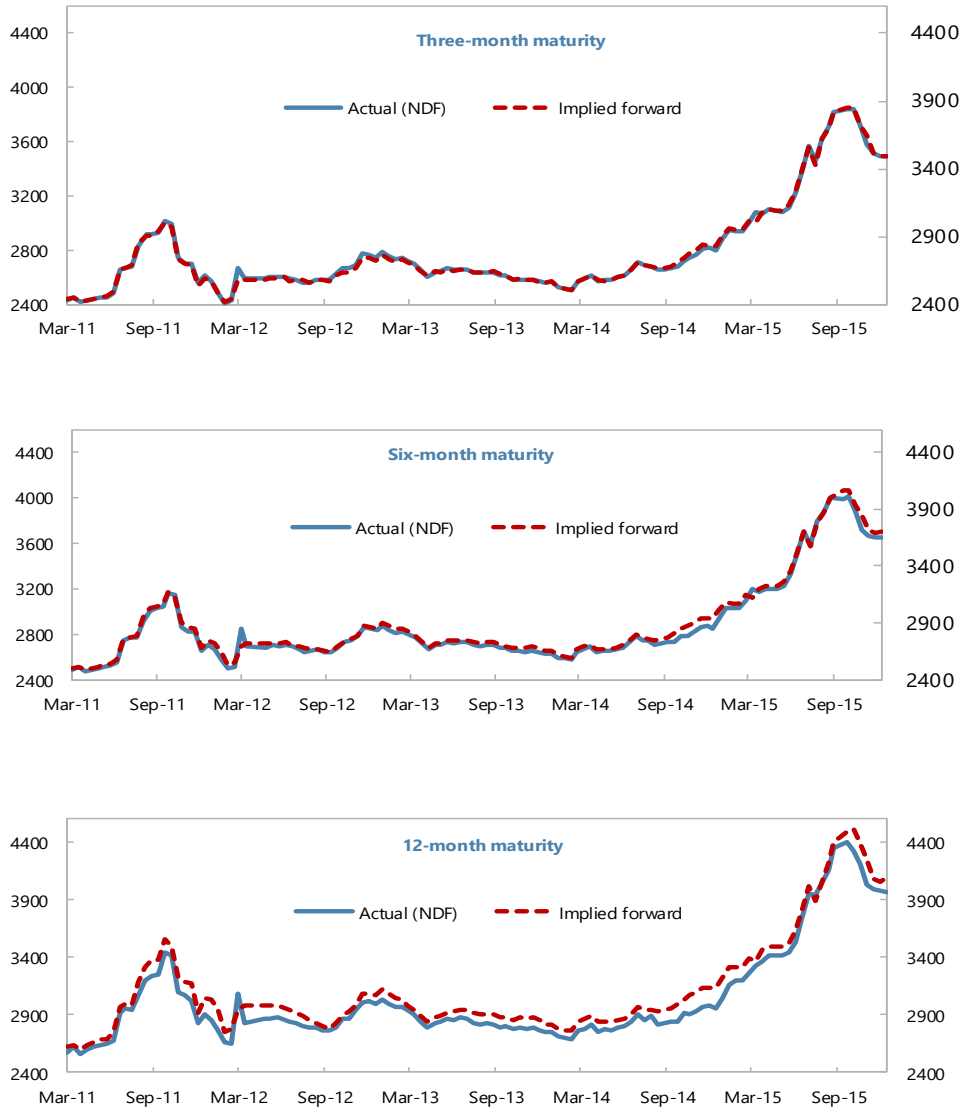
Sources: Central Bank of Kenya; Bloomberg; and IMF staff estimates.

Figure A4.3. Tanzania: Actual (NDF) and Implied Forward Exchange Rates (2011–15)
(National currency per US$)



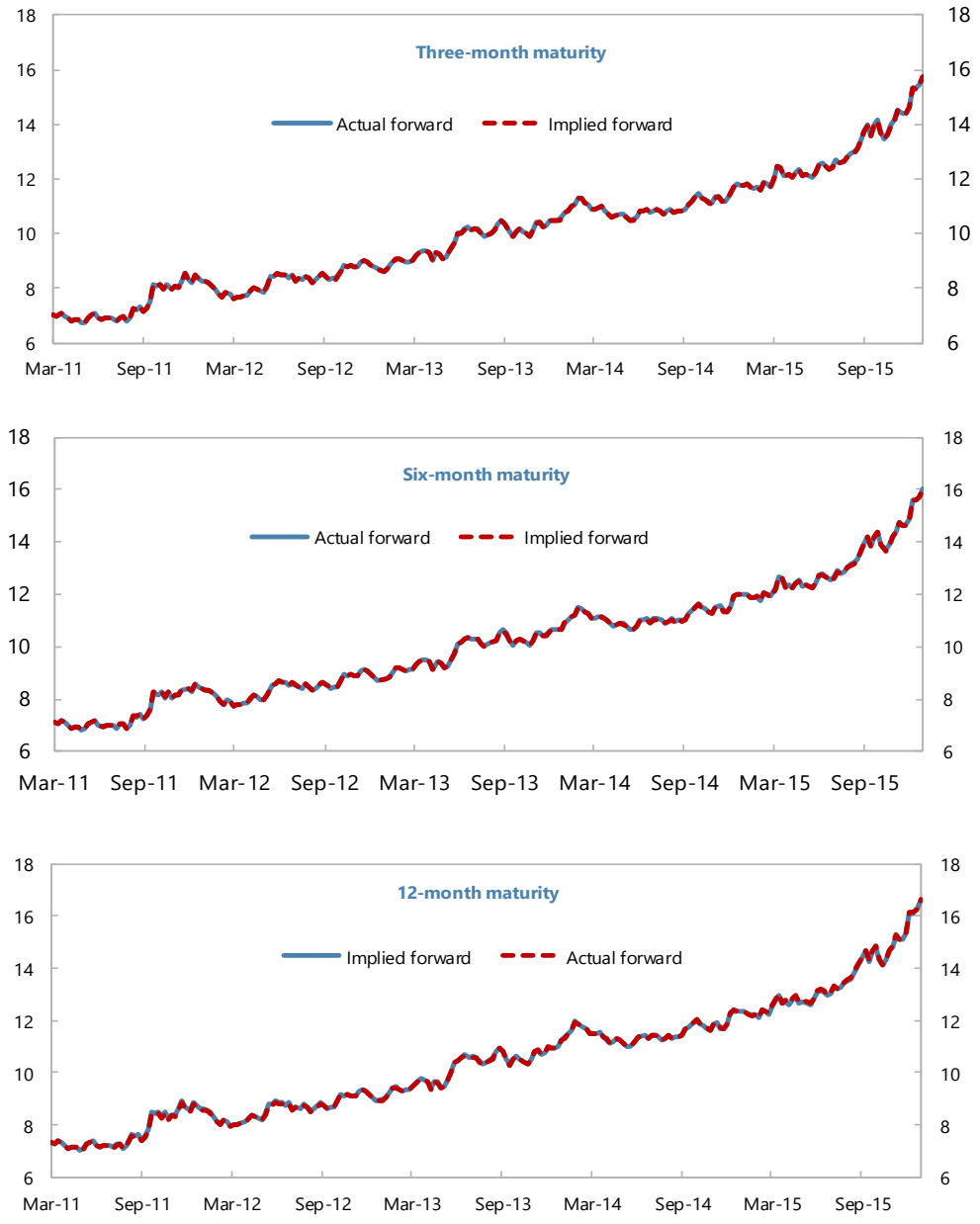
Sources: Bank of Tanzania; Bloomberg; U.S. Federal Reserve; and IMF staff estimates.

Figure A4.4. Uganda: Actual (NDF) and Implied Forward Exchange Rates (2011–15)
(National currency per US$)



Sources: Bank of Uganda; Bloomberg; U.S. Federal Reserve; and IMF staff estimates.

Figure A4.5. South Africa: Actual and Implied Forward Exchange Rates (2011–15)
(National currency per US$)



Sources: Reserve Bank of South Africa; Bloomberg; U.S. Federal Reserve; and staff estimates.

Table A4.1. Summary Statistics of CIP Deviations Relative to the United States

Three-month maturity
(Percent)

	Kenya	Tanzania	Uganda	South Africa
Period	1/11-12/15	1/11-12/15	1/11-12/15	1/11-12/15
No. of observations	248	122	126	257
Median	-0.34	0.03	-0.05	0.04
Mean	-0.17	0.16	0.03	0.05
Minimum	-1.43	-1.11	-1.70	-0.07
Maximum	1.84	2.85	3.49	0.31
Standard deviation	0.64	0.71	0.62	0.07
Frequency	Weekly	Biweekly	Biweekly	Weekly

Six-month maturity
(Percent)

	Kenya	Tanzania	Uganda	South Africa
Period	1/11-12/15	1/11-12/15	1/11-12/15	1/11-12/15
No. of observations	232	121	127	256
Median	-1.00	-0.60	-0.85	0.02
Mean	-0.78	-0.47	-0.89	0.03
Minimum	-2.94	-3.84	-3.28	-0.33
Maximum	2.83	3.86	5.54	0.39
Standard deviation	1.25	1.32	0.94	0.11
Frequency	Weekly	Biweekly	Biweekly	Weekly

12-month maturity[1]
(Percent)

	Kenya	Tanzania	Uganda	South Africa
Period	3/13-12/15	1/11-9/15	1/11-12/15	1/11-12/15
No. of observations	145	117	125	254
Median	-3.24	-2.00	-2.74	-0.09
Mean	-2.95	-2.28	-2.73	-0.08
Minimum	-5.58	-5.86	-5.97	-0.98
Maximum	-0.14	4.31	5.10	0.52
Standard deviation	1.19	1.99	1.42	0.27
Frequency	Weekly	Biweekly	Biweekly	Weekly

Sources: Bloomberg; and IMF staff calculations.

[1] Twelve-month T-bill auctions were conducted once a month until March 2013 in Kenya. The descriptive statistics reported in the table for 12-month maturity are based on weekly auctions since March 2013. 12-month NDF rates for Tanzania are not available since September 2015.

Table A4.2. Summary Statistics of Absolute CIP Deviations Relative to the United States

Three-month maturity
(Percent)

	Kenya	Tanzania	Uganda	South Africa
Period	1/11-12/15	1/11-12/15	1/11-12/15	1/11-12/15
No. of observations	248	122	126	257
Median	0.49	0.45	0.26	0.05
Mean	0.55	0.56	0.41	0.06
Minimum	0.01	0.01	0.00	0.00
Maximum	1.84	2.85	3.49	0.31
Standard deviation	0.37	0.47	0.47	0.06
Frequency	Weekly	Biweekly	Biweekly	Weekly

Six-month maturity
(Percent)

	Kenya	Tanzania	Uganda	South Africa
Period	1/11-12/15	1/10-12/15	1/11-12/15	1/11-12/15
No. of observations	232	121	127	256
Median	1.26	1.12	1.04	0.09
Mean	1.24	0.99	0.87	0.08
Minimum	0.01	0.02	0.04	0.00
Maximum	2.94	3.86	5.54	0.39
Standard deviation	0.77	0.84	0.77	0.07
Frequency	Weekly	Biweekly	Biweekly	Weekly

12-month maturity[1]
(Percent)

	Kenya	Tanzania	Uganda	South Africa
No. of observations	145	117	125	254
Median	3.14	2.43	2.84	0.21
Mean	2.90	2.42	2.74	0.16
Minimum	0.14	0.12	0.59	0.00
Maximum	5.58	5.86	5.97	0.98
Standard deviation	1.27	1.42	1.20	0.18
Frequency	Weekly	Biweekly	Biweekly	Weekly

Sources: Bloomberg and IMF staff calculations.

[1] Twelve-month T-bill auctions were conducted once a month until March 2013 in Kenya. The descriptive statistics reported in the table for 12-month maturity are based on weekly auctions since March 2013.
12-month NDF rates for Tanzania are not available since September 2015.

Table A4.3. Summary Statistics of Absolute CIP Deviations Relative to the EAC[1]

Three-month maturity
(Percent)

	Kenya	Tanzania	Uganda
Period	3/11-9/15	3/11-9/15	4/11-9/15
No. of observations	108	108	107
Median	0.93	0.67	3.24
Mean	1.00	0.78	3.07
Minimum	0.01	0.02	0.18
Maximum	3.06	3.65	6.86
Standard deviation	0.64	0.62	1.26
Frequency	Biweekly	Biweekly	Biweekly

Six-month maturity
(Percent)

	Kenya	Tanzania	Uganda
Period	6/11-9/15	6/11-9/15	6/11-9/15
No. of observations	100	100	105
Median	0.93	1.28	1.27
Mean	1.02	1.36	1.49
Minimum	0.02	0.00	0.08
Maximum	3.95	4.69	5.68
Standard deviation	0.80	1.13	1.07
Frequency	Biweekly	Biweekly	Biweekly

12-month maturity [2]
(Percent)

	Kenya	Tanzania	Uganda
Period	3/11-9/15	3/11-9/15	3/11-9/15
No. of observations	106	106	105
Median	1.71	2.00	2.06
Mean	2.65	2.55	2.74
Minimum	0.01	0.00	0.00
Maximum	10.41	9.36	10.78
Standard deviation	2.35	2.10	2.41
Frequency	Biweekly	Biweekly	Biweekly

Sources: Bloomberg; World Economic Outlok database; and IMF staff calculations.

[1] For each country, generic EAC averages are calculated for each variable in the CIP, using purchasing power parity GDP weights of the remaining two countries.

[2] Twelve-month T-bill auctions were conducted once a month until March 2013 in kenya. The statistics reported in the table for 12-month maturity is based on weekly auctions since March 2013. 12-month NDF rates for Tanzania is not available since September 2015.

Appendix V. Application of Convergence Concepts in the EAC

Background

The concept of financial market integration is closely related to the law of one price.[1] Capital mobility, when not impeded, would ensure that financial market prices—yields—of assets identical in denomination, maturity, and risk would be the same. Thus, the presence of differences in (1) capital controls, (2) underlying risks, and (3) expectations of currency movements would cause a "wedge" among financial prices or implied returns. Such conditions in general do not hold.[2] Nevertheless, it would still be informative to see the evolution of the wedge to see if such differences among countries move in the "right" direction—that is, if the dispersion of such yields is decreasing in time or the returns are converging. A reduction in dispersion, or "convergence" of yields of assets with the same maturity, would indicate increasing financial integration through reduction in capital controls and/or diminishing of differences in underlying risks, and expectations of currency depreciation/appreciation for the duration of the holding period.

Data and Methodology

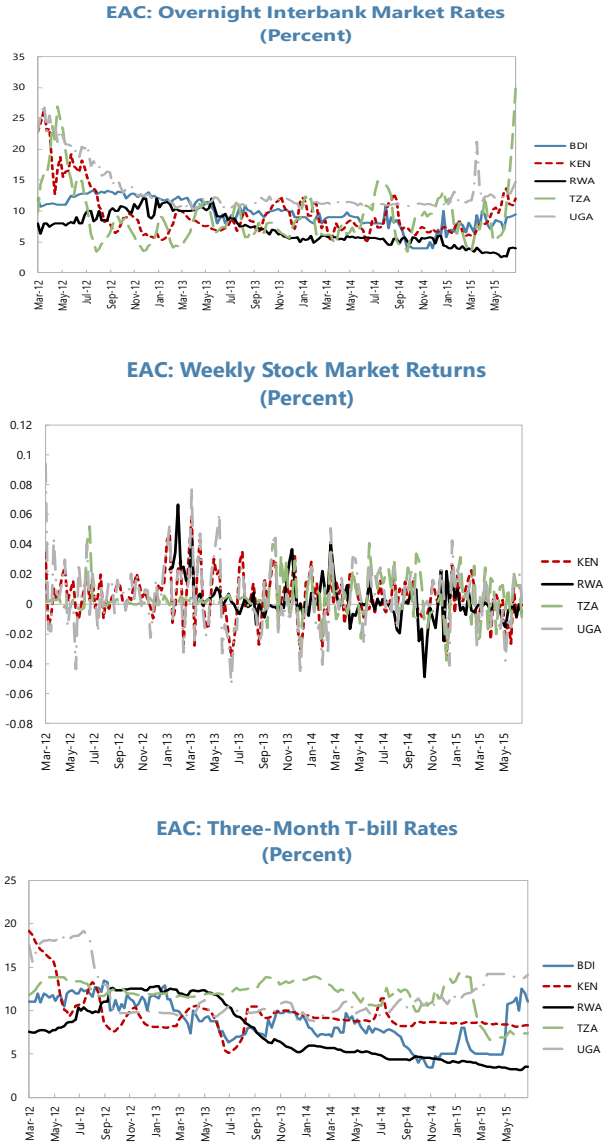
The preceding analysis introduces the concepts of β-convergence and σ-convergence in yields of selected assets and maturities within the EAC countries during 2011–15. Specifically, it considers weekly stock market returns in the EAC (with the exception of Burundi); weekly averages of overnight interbank rates; and weekly and biweekly three-, six-, and 12-month T-bill auction

[1]See for example Adam and others (2002) and Srivatsa and Lee (2010).

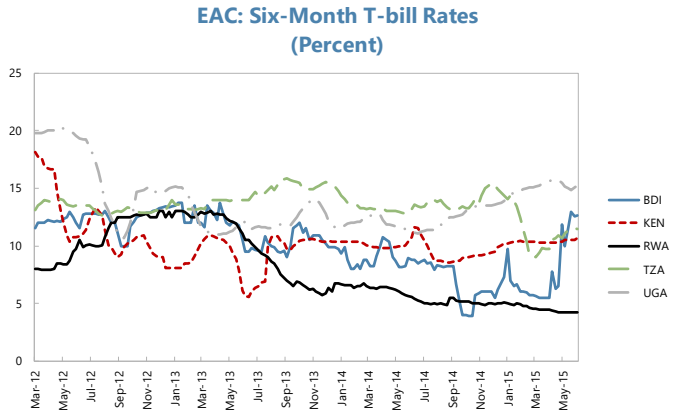
[2]In a monetary union, for example, conditions (1) and (3) would mostly be the same across member countries but condition (2) may still be different.

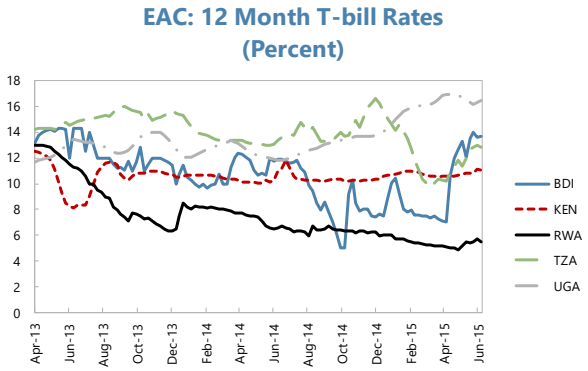
yields in domestic currencies.[3] Data are from Bloomberg and EAC country central banks (Figure A5.1).

Figure A5.1. Various EAC Financial Returns Data Used in Convergence Analysis



[3]As discussed earlier, there are no formal onshore forward market rates in the EAC countries to show market expectations of depreciation/appreciation during the holding period of an asset. One option would be to analyze ex post returns in U.S. dollars based on actual changes in currencies' values during the holding period, but that would bring additional noise in the data. Thus, identical rates of expected depreciation or appreciation among EAC countries were assumed.





Two different convergence concepts are used: β-convergence and σ-convergence, because they capture different aspects of financial integration. While the former shows to what extent financial convergence has been achieved within the EAC in the observed sample, the latter shows whether markets are moving toward integration over time.

β-convergence enables the identification of the speed at which shocks are eliminated on the yields of assets with identical maturities traded in EAC countries' financial markets. The measure involves estimating the following time series regression for each country or panel regression for the whole EAC:

$$\Delta Spread_{i,t} = \beta_0 + \beta_1 Spread_{i,t-1} + \sum_{j=1}^{N} \gamma_j \Delta Spread_{i,t-j} + \varepsilon_{i,t}$$

Spread variable denotes the spread of yield on an underlying asset of a specific maturity (one day or three, six, or 12 months) between country *i* and the

synthetic EAC region, formed from the PPP-GDP weights of the remaining four EAC countries.[4] The weights are Burundi, 2.3 percent; Kenya, 36.6 percent; Rwanda, 5.2 percent; Tanzania, 35.1 percent; and Uganda, 20.7 percent in 2013. *N*represents the number of lags used in this regression to clean the residuals from autocorrelation. In our estimations we include lags up to eight weeks during 2011–15.

The β_0 coefficient would provide the average "wedge" between an underlying asset for a specific maturity (one day or three, six, or 12 months) between country *i* and the synthetic EAC region. The β_1 coefficient, if significantly negative, would suggest the existence of convergence—that is, mean reversion taking place between country *i* and the synthetic EAC region for an underlying asset for a specific maturity (one day or three, six, or 12 months). The magnitude of the β_1 coefficient would denote the speed of convergence, with speed increasing in β_1. Panel- and country-specific time series regression results are given in Table A5.1.

σ-convergence occurs when the dispersion of the levels of a yield of a specific asset between different EAC countries tends to decrease over time. The concept owes its origins to seminal work by Barro and Sala-i Martin (1992) on cross-sectional dispersion of income. The current analysis checks whether the dispersion, "σ," tends to decrease over time for a number of selected assets in the EAC:

$$\sigma_t = \left[\frac{1}{n-1}\sum_{i=1}^{n}\left(R_{i,t} - \overline{R}_t\right)^2\right]^{\frac{1}{2}}$$

R_{it}denotes the return for an asset in country *i* at time *t*, and $\tilde{R}_t$ denotes the EAC-wide mean return at time *t*. Lower σ values imply higher levels of financial convergence. In theory, full integration ("law of one price") would be implied when the standard deviation is zero. Figure A5.2 gives the evolution of σ within EAC for a number of assets.

[4]Yabara (2012) uses Kenya as the benchmark market. For each country, this paper uses as the benchmark country a synthetic EAC country (based on PPP GDP weights) after excluding the country itself. This methodology enables reporting results also for Kenya.

Table A5.1. Pooled and Individual Beta Coefficients of EAC Countries' Selected Asset Yields (2011–15)

Stock Exchange Markets

	Pooled Regression				Individual Regression			
	OLS	Fixed effects	Random effects	GMM	KEN	RWA	TZA	UGA
β	-0.747***	-0.762***	-0.747***	-0.782***	-0.781***	-0.657***	-0.742***	-0.893***
	(0.000)	(0.000)	(0.00)	(0.00)	(0.000)	(0.000)	(0.000)	(0.000)
N	676	676	676	676	169	169	169	169
R-squared	0.395	0.399	0.399	-	0.419	0.319	0.386	0.470
Half-life of deviations (weeks)	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.3

Overnight Rate Market

	Pooled Regression				Individual Regression				
	OLS	Fixed effects	Random effects	GMM	BDI	KEN	RWA	TZA	UGA
β	-0.074***	-0.114***	-0.074***	-0.127***	-0.059 **	-0.311***	-0.032	-0.191***	-0.136 **
	(0.000)	(0.000)	(0.000)	(0.000)	(0.026)	(0.000)	(0.136)	(0.000)	(0.011)
N	850	850	850	850	170	170	170	170	170
R-squared	0.055	0.057	0.059	-	0.038	0.263	0.019	0.186	0.042
Half-life of deviations (weeks)	9.1	5.7	9.0	5.1	11.4	1.9	21.1	3.3	4.7

Three-month T-Bill Market

	Pooled Regression				Individual Regression				
	OLS	Fixed effects	Random effects	GMM	BDI	KEN	RWA	TZA	UGA
β	-0.024***	-0.042***	-0.024***	-0.036 **	-0.058	-0.122***	-0.014	-0.049***	-0.019
	(0.000)	(0.000)	(0.000)	(0.017)	(0.075)	(0.000)	(0.132)	(0.005)	(0.131)
N	850	850	850	850	170	170	170	170	170
R-squared	0.082	0.081	0.086	-	0.022	0.449	0.183	0.204	0.340
Half-life of deviations (weeks)	28.1	16.3	28.5	18.7	11.6	5.3	49.2	13.8	35.4

Six-month T-Bill Market

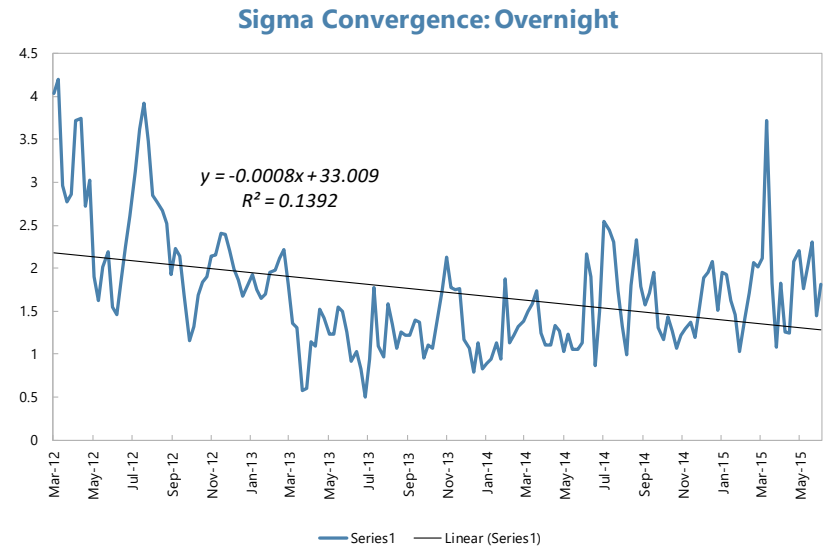
	Pooled Regression				Individual Regression				
	OLS	Fixed effects	Random effects	GMM	BDI	KEN	RWA	TZA	UGA
β	-0.011	-0.019	-0.011	-0.005	0.038	-0.065***	-0.010	-0.030***	-0.015
	(0.069)	(0.016)	(0.069)	(0.816)	(0.249)	(0.002)	(0.480)	(0.007)	(0.101)
N	846	846	846	846	167	170	170	170	170
R-squared	0.044	0.047	0.049	-	0.015	0.332	0.067	0.337	0.445
Half-life of deviations (weeks)	61.3	35.5	61.3	133.4	-18.7	10.3	68.2	23.0	45.7

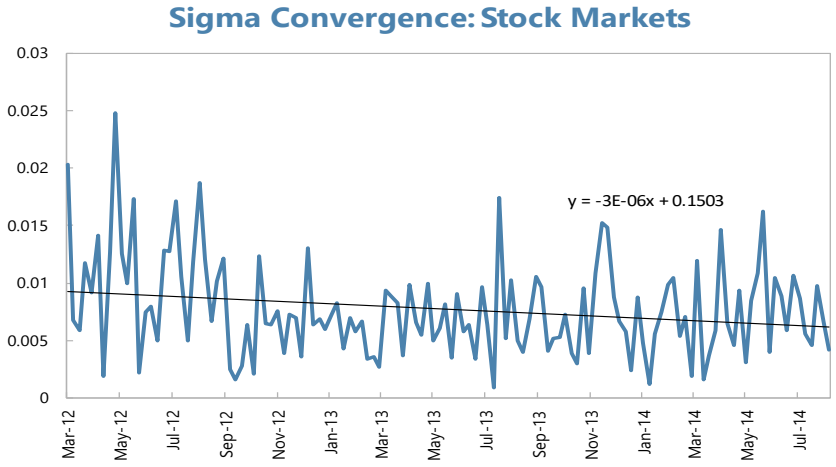
12-month T-Bill Market

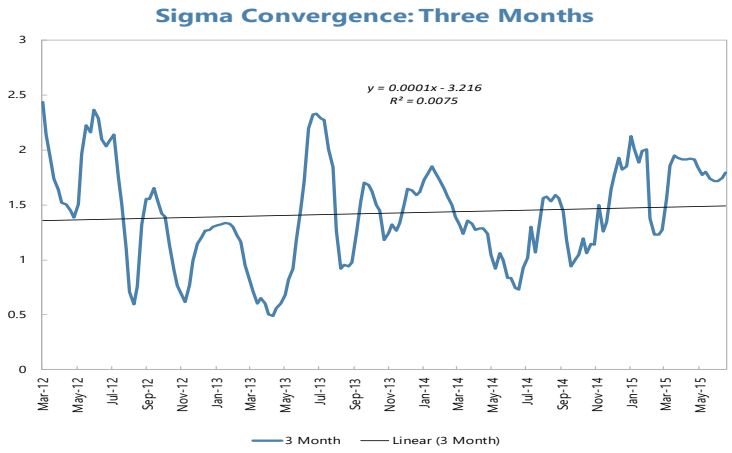
	Pooled Regression				Individual Regression				
	OLS	Fixed effects	Random effects	GMM	BDI	KEN	RWA	TZA	UGA
β	-0.019	-0.086***	-0.019	-0.143	-0.084 **	-0.255***	-0.015	-0.041	-0.116***
	(0.035)	(0.000)	(0.034)	(0.231)	(0.043)	(0.000)	(0.649)	(0.154)	(0.000)
N	*575*	*575*	*575*	*575*	*115*	*115*	*115*	*115*	*115*
R-squared	*0.271*	*0.231*	*0.276*	-	*0.026*	*0.327*	*0.525*	*0.164*	*0.631*
Half-life of deviations (weeks)	35.4	7.7	35.4	4.5	7.9	2.4	45.6	16.5	5.6

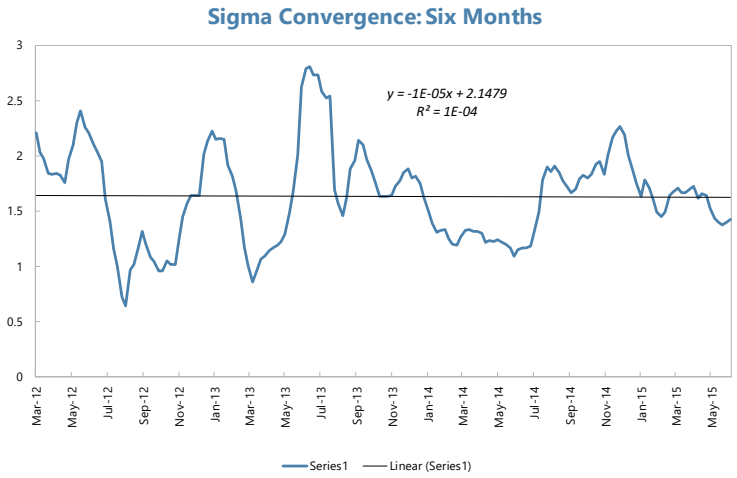
Sources: Bloomberg; EAC authorities; IMF staff estimates.
Note: Standard errors in parentheses. *** denotes significance at 1 percent, ** at 5 percent, and * at 10 percent levels.

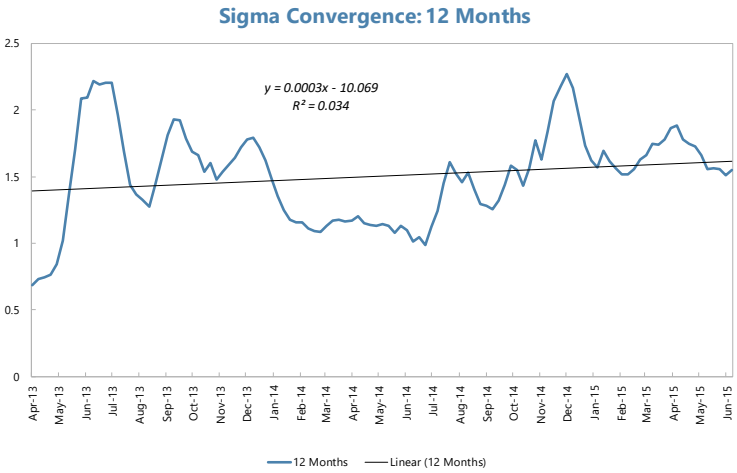
Figure A5.2. Sigma-Convergence Analysis for the EAC Countries






Sigma Convergence: Three Months
y = 0.0001x - 3.216
R² = 0.0075
3
2.5
2
1.5
1
0.5
0
Mar-12
May-12
Jul-12
Sep-12
Nov-12
Jan-13
Mar-13
May-13
Jul-13
Sep-13
Nov-13
Jan-14
Mar-14
May-14
Jul-14
Sep-14
Nov-14
Jan-15
Mar-15
May-15
3 Month
Linear (3 Month)


Sigma Convergence: Six Months
y = -1E-05x + 2.1479
R² = 1E-04
3
2.5
2
1.5
1
0.5
0
Mar-12
May-12
Jul-12
Sep-12
Nov-12
Jan-13
Mar-13
May-13
Jul-13
Sep-13
Nov-13
Jan-14
Mar-14
May-14
Jul-14
Sep-14
Nov-14
Jan-15
Mar-15
May-15
Series1
Linear (Series1)


Sigma Convergence: 12 Months
y = 0.0003x - 10.069
R² = 0.034
2.5
2
1.5
1
0.5
0
Apr-13
May-13
Jun-13
Jul-13
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
Feb-14
Mar-14
Apr-14
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
12 Months
Linear (12 Months)