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Capital Market Integration: Progress Ahead of the East African Community Monetary Union

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Abstract

Capital markets in the East African Community (EAC) face common challenges of low capitalization and liquidity, but to different degrees. EAC member countries have made noticeable progress in developing domestic capital markets through a regional approach, removing constraints on capital transactions and harmonizing market infrastructure. Nevertheless, empirical analysis suggests capital market integration has not deepened during the past few years in the EAC, although convergence of investment returns is taking place to some extent. Learning from the experience of the West African Economic and Monetary Union and the Association of Southeast Asian Nations, EAC countries would benefit from four actions to accelerate financial market integration: (i) further harmonize market infrastructure; (ii) strengthen regional surveillance mechanisms; (iii) encourage local currency bond issuance by multilateral financial institutions; and (iv) build the capacity of the existing regional institutions.

I. INTRODUCTION

Well-functioning capital markets[2] can accelerate economic growth and therefore alleviate poverty. A large body of research has found evidence that capital market development contributes to economic growth, including in sub-Saharan African countries (Levine and Zervos, 1998; Adjasi and Biekpe, 2006b). Developed capital markets promote growth by mobilizing domestic savings and investments and by efficiently allocating mobilized resources to local companies. In addition, deep and liquid local capital markets can lessen vulnerability of an economy to external shocks, by reducing currency and duration mismatches in raising funds. Cross-country evidence shows that financial development can reduce income inequality by increasing the income of the poor (MFW4A, 2007).

In spite of these merits, capital markets remain underdeveloped in most low-income countries owing to structural constraints. Limited income and the small size of the private sector make investors and issuers scarce. Running capital markets entails huge start-up and operating costs for both the regulators and market participants. This can be prohibitive for countries with limited capacity and small markets: authorities are required to establish and manage regulatory frameworks and trading platforms, and issuers need to go through painstaking due diligence processes for initial offerings and maintain detailed financial reporting afterwards. An empirical study suggests that there exists a certain minimum-efficient size of bond markets, because large issuance and trading volumes are more economical (Eichengreen and Luengnaruemitchai, 2004).

Regional integration has the potential to help countries overcome these constraints. Integrated capital markets, if managed properly, will allow savings to be pooled across the region; cost and information sharing among members; diversification of risks; enhanced competition and innovation across financial institutions; wider choices of financial products provided to regional and foreign investors; and more integration into the global economy facilitated by increased attractiveness of markets (Irving, 2005; MFW4A, 2007).

Countries of the East African Community (EAC)[3] have been pursuing development of capital markets through regional integration. Having well-functioning local capital markets is important for these countries because they need large amounts of financing to build infrastructure for sustained growth. Capital markets are needed as an alternative source of financing, supplementing commercial banks, which dominate the EAC financial sector with low competitiveness (Gaertner, Sanya, and Yabara, 2011). Recognizing the benefits of capital markets and the limitations of individual country approaches, the EAC member states are

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[2] Capital markets generally consist of equity markets and bond markets, where issuers can raise long-term funds. In addition to these markets, this paper also covers treasury bill markets where governments raise short-term funds, considering the critical role of the markets in establishing a monetary union.

[3] The EAC was established in 2000 by Kenya, Tanzania, and Uganda; Burundi and Rwanda joined in 2007. Its objectives are to deepen cooperation among member states in political, economic, and social fields to establish a monetary union and ultimately a political federation of East African states. A customs union was established in 2005, followed by the starting up of a common market in 2010. The member states are currently negotiating a monetary union protocol to establish a monetary union by 2012.

committed to establishing a common market, which would include free movement of capital under the treaty establishing the community. Furthermore, integration of financial markets, in particular government debt markets, is essential for a monetary union to transmit common monetary policy effectively across the region and fully realize the benefits of a monetary union. It is an urgent challenge, given the member states' ambitious target to forge a monetary union by 2012.

This paper empirically investigates whether actions taken under the EAC framework have succeeded in advancing integration of financial markets. Few preceding studies exist on this subject. IMF (2009) assesses comovements of government bond yields among Kenya, Uganda, and Tanzania. Wang (2010) measures deviations from covered interest rate parity in money markets for the same countries. Both of these studies conclude that financial integration is limited in the EAC. This paper contributes to the literature by comprehensively assessing integration of the EAC capital markets, both debt and stock markets, and examining whether integration has progressed over time. The paper also reviews other regional initiatives to integrate and develop local currency debt markets to draw practical recommendations for the EAC, given the urgent need to accelerate debt market integration.

Although there is no universal definition of financial integration, in general, financial markets are said to be integrated when the law of one price holds. In perfectly integrated financial markets with no barriers to cross-border transactions, returns of comparable assets should be equalized across economies, so long as there is no difference in country risks and exchange risks. In this sense, it should be noted that financial integration can be achieved without any institutionalized unification of markets: the markets of the United States and the United Kingdom are said to be highly integrated, although these markets are separate under different legal frameworks. The literature relies on two broad categories of measures to assess financial integration: price-based and quantity-based measures. The former directly estimate whether and at what speed rates of return of comparable assets converge across borders. The latter investigate correlation between domestic savings and investment, building on the idea of Feldstein and Horioka (1980) that in a world of high capital mobility, there should be no relation between domestic savings and investments, because domestic investments are financed by a pool of global savings under a unified interest rate. This paper relies on the price-based measures because the measures have a clear-cut interpretation; price data are simple and relatively reliable compared to savings and investment data in low-income countries; and the measures have high frequency, allowing assessment of progress in integration over a relatively short term.

The rest of the paper is organized as follows. Section II briefly describes the EAC capital markets and assesses the challenges. Section III reviews the authorities' cooperative efforts to integrate their capital markets under the EAC framework. Section IV investigates whether financial market integration is taking place in the EAC, using empirical methods. Section V refers to regional initiatives in West Africa and East Asia to draw lessons for the EAC to accelerate capital market integration. Section VI concludes.

II. EAC CAPITAL MARKETS: STYLIZED FACTS

A. Current Market Structure

Debt Markets

All five EAC countries operate government debt markets at different stages of development. Central banks in all the EAC countries hold auctions under different frameworks (Table 1) to sell treasury bills and bonds on behalf of the governments, as instruments for monetary and fiscal policy implementation. These auctions are open to nonresidents except in Tanzania, where nonresidents are prohibited from holding government securities (Annex 1). Issued securities are traded over-the-counter and/or in local stock exchanges, although the secondary markets are largely inactive as argued below.

Table 1. Auction of Government Securities

	Burundi		Kenya		Rwanda		Tanzania		Uganda	
	T-bill	T-bond	T-bill	T-bond	T-bill	T-bond	T-bill	T-bond	T-bill	T-bond
Maturity	13–52 weeks	2–5 years	13–52 weeks	1–30 years	4–52 weeks	2–5 years	5–52 weeks	2–10 years	13–52 weeks	2–10 years
Auction frequency	Weekly	Weekly	Weekly	Monthly	Weekly	Monthly	Biweekly	Monthly	Biweekly	Monthly
Minimum bid amount	Fbu 100 million ($81,200)		KSh 0.1 million ($1,200)	KSh 0.05 million ($600)	Rwf 0.1 million ($200)		TSh 0.5 million ($300)	Tsh 1 million ($700)	Ush 0.1 million ($400)	
Nonresident	Eligible		Eligible		Eligible		Ineligible		Eligible	

Source: AfDB, *African Fixed Income and Derivatives Guidebook;* and central bank websites.

Size of the market considerably differs among the countries (Table 2). Kenya leads the region, with government securities outstanding at 27.3 percent of GDP and with maturities of up to 30 years. Tanzania and Uganda follow with amounts outstanding of 10.3 percent and 8.1 percent of GDP, respectively. These two countries succeeded in extending the maturities of treasury bonds to 10 years in the 2000s. Markets in Burundi and Rwanda were recently instituted. The Central Bank of Burundi started auctioning government securities at end-2006, with maturities now up to 10 years. Rwanda launched its over-the-counter (OTC) securities market in 2008 and started listing government securities there. A first five-year treasury bond was marketed in Rwanda in 2010, and the OTC market was converted to a stock exchange in January 2011. While the size of the market is relatively large in Burundi, at 8.5 percent of GDP, the market in Rwanda is only 2.2 percent of GDP. [4]

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[4] The relatively large scales of securities outstanding in Tanzania and Burundi partly are due to central bank holdings of government securities (Table 5).

Table 2. EAC: Treasury Bills and Bonds Outstanding at End-2010

	Burundi[1]	Kenya	Rwanda	Tanzania	Uganda[2]
		(millions of US dollars)			
Treasury bills and bonds	126	8,612	120	2,080	1,230
Treasury bills	n.a.	2,046	94	445	544
Treasury bonds	n.a.	6,566	25	1,635	686
		(percent of GDP)			
Treasury bills and bonds	8.5	27.3	2.2	10.3	8.1
Treasury bills	n.a.	6.5	1.7	2.2	3.6
Treasury bonds	n.a.	20.8	0.5	8.1	4.5

Source: EAC central banks; IMF, *World Economic Outlook;* and author's calculations.

[1] As of September 2010. Includes other debts held by nonfinancial institutions.

[2] As of June 2010.

Corporate bonds are issued in the EAC countries except for Burundi and traded at local stock exchanges. The markets, however, are at nascent stages and are inactive, with local companies mainly relying on commercial bank financing. The amounts outstanding are negligible when measured as percent of GDP (Table 3); issuers are limited to financial institutions, especially foreign affiliated institutions. Transactions in the secondary markets rarely take place even in the stock exchange of Kenya, the Nairobi Stock Exchange (NSE).

Table 3. EAC: Corporate Bond Markets at End-2010

	Kenya	Rwanda	Tanzania	Uganda
Number of issuers	10	1	5	5
Amount outstanding (million US$)	743.8	1.7	51.6	44.3
Amount outstanding (percent of GDP)	2.4	0.03	0.26	0.29

Source: EAC stock exchanges; IMF, *World Economic Outlook* ; and author's calculations.
Note: There exists no operational corporate bond market in Burundi.

Stock Markets

Disparities across the region are larger in stock markets than in debt markets. The NSE, established in 1954, has the longest history and is by far the largest in the region. It has 55 listed companies, reaching market capitalization of 46 percent of GDP as of end-2010 (Table 4). The Dar es Salaam Stock Exchange (DSE) in Tanzania and the Uganda Securities Exchange (USE), instituted in the late 1990s, have market values of about 15 percent of GDP. The Rwanda Stock Exchange (RSE) has only two companies listed as of end-2010,[5] with transactions seldom taking place. There is no stock exchange in Burundi, and capital is raised mainly from commercial banks.

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[5] In January 2011, Bralirwa, a brewing company, became the third company listed on the RSE.

Table 4. EAC: Stock Markets at End-2010

	Kenya	Rwanda	Tanzania	Uganda
Number of companies listed	55	2	15	13
Market capitalization (million US$)	14,498	n.a.	3,253	1,810
Market capitalization (percent of GDP)	46.0	n.a.	16.1	11.9
Turnover (million US$)	1,283	0.01	23.9	18.4
Turnover ratio[1]	8.8	n.a.	0.7	1.0

Source: EAC authorities; IMF, *World Economic Outlook;* and author's calculations.
Note: There exists no operational stock market in Burundi.

[1] The ratio of turnover to market capitalization.

B. Challenges for the EAC Capital Markets

Despite the diversified degrees of development, the EAC countries face the same challenges as other low-income countries in developing domestic capital markets: low capitalization and liquidity. Owing to the costs of issuing and listing securities, issuers in the markets are overly confined to government entities, former state-owned enterprises, and foreign-affiliated banks. Low income and savings prevent individuals from participating in the markets, leaving the investor bases heavily dominated by commercial banks and pension funds (Table 5). Whereas foreign investors' transactions occupy fair amounts of total turnovers, available statistics, though the coverage is restricted, indicate that nonresident holdings of securities stand at substantially low levels in the EAC compared to the aggregate of sub-Saharan Africa (Figure 1). [6] From a regional perspective, holdings by EAC investors are only 3.2 percent of total shares in the NSE, indicating intra-regional capital transactions are still limited, notwithstanding the authorities' efforts discussed below. As a result, market size has remained small, and governments are largely dependent on external sources of financing, including concessional borrowing (Figure 1).

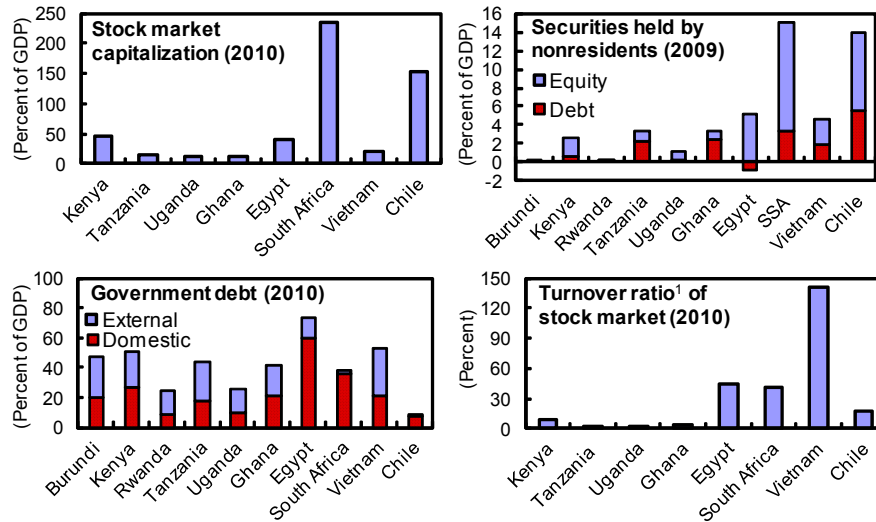**Table 5. Bond Holding by Category of Investors (in percent, as of June 30, 2009)**

Burundi[1]		Kenya		Rwanda[1]		Tanzania[1]		Uganda	
Commerical Banks	65	Commercial banks	53	Commercial banks	83	Central bank	41	Commercial banks	77
Central bank	24	Pension funds	27	Pension funds	2	Commercial banks	30	Pension funds	15
Insurance companies	6	Insurance companies	11	Insurance companies	2	Pension funds	23	Central bank	5
Pension funds	4	Individuals	2	Others	13	Nonbank	2	Insurance companies	2
Others	0.2	Others	6			Insurance companies	2	Individuals	1
						Individuals	1		
						Others	1		

Source: AfDB, *African Fixed Income and Derivatives Guidebook.*

[1] Figures include only government security holdings, not corporate bonds.

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[6] Data are compiled from the Coordinated Portfolio Investment Survey conducted by the IMF and are available at http://www.imf.org/external/np/sta/pi/datarsl.htm. About 75 countries voluntarily participate in the survey, reporting cross-border holdings of portfolio investment securities, classified by issuers.

Figure 1. Comparison of Capital Markets

Source: EAC authorities; World Federation of Exchanges; IMF, *World Economic Outlook,
Regional Outlook: Sub-Saharan Africa,* and *Coordinated Portfolio Investment
Survey;* World Bank, *World Development Indicators;* and author's calculations.

[1] The ratio of turnover to market capitalization.

Low liquidity also is due to the shallow investor bases. Local commercial banks and pension
funds, dominant investors in the region, generally tend to hold securities until maturity. Market
infrastructure is another impediment to enhancing liquidity of the markets. While trading
infrastructure consisting of real-time-gross-settlement systems, clearing houses, and central
securities depositories are all operational with the exception of Burundi, these systems are yet to
be connected outside the borders, rendering investments by foreign investors costly and time-
consuming. These constraints create rather illiquid capital markets in the EAC. Figure 1 shows a
turnover ratio of nearly zero in the Tanzania and Uganda stock markets. There is no secondary
market in Burundi: most investments are held to maturity.

III. Regional Initiatives to Integrate the EAC Capital Markets

EAC countries have pursued developing their capital markets through regional integration. In the
Treaty for the Establishment of the East African Community, the member states committed to
establishing a common market with free movement of capital. Specifically, the treaty calls for:
(i) removal of controls on capital transactions among the member countries (Article 86) and
(ii) harmonization of capital market infrastructure including regulations, taxation, accounting,
trading systems, and cross-listings of securities (Article 85).[7] The common market was officially
launched in June 2010, awaiting full implementation by 2015. The Common Market Protocol
requires legislation by each member to fully implement the common market by 2015. The
annexes to the protocol provide timetables of actions to be undertaken by each state, including
capital account liberalization.

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[7] Adelegan (2008) and (2009) find positive effects of cross-listings of securities in deepening capital markets and
increasing values of companies cross-listed in sub-Saharan Africa.

Liberalizing capital transactions and harmonizing market infrastructure are essential and natural steps toward capital market integration. Regulations for cross-border capital transactions prevent domestic investors from freely participating in foreign markets and foreign investors from investing in domestic markets, making barriers to cross-border financial flows. Nonharmonized market infrastructure hampers cross-border transactions and constitutes another barrier to capital market integration. Because financial transactions are affected by many factors such as regulatory frameworks, trading systems, and taxation, harmonization of these market settings is essential in realizing the law of one price. The ultimate form of capital market integration is the unification of the entire market infrastructure, in which all participants can engage in financial activities across borders in exactly the same way as they do in their home countries.

A. Capital Account Liberalization[8]

Although liberalizing capital transactions across a region is the first step for integrated capital markets, countries' experience illustrates that capital account liberalization could be a cause of a crisis by making an economy vulnerable to external capital flows. To minimize the adverse effects, countries are advised to sequence the process of liberalization and advance it along with comprehensive pro-market reforms to maintain the stability of an economy (Ishii and Habermeier, 2002).

Uganda, Rwanda, and Kenya have already liberalized capital transactions within the region (Annex 1). Uganda was the first to fully open capital accounts in 1997, as part of a broader package of market-oriented reforms. Rwanda achieved full capital account liberalization in 2010. Even though restrictions on nonresidents' investments in domestic markets remain in Kenya, East African investors are treated as local investors, meeting the commitment under the treaty.

Plans for gradual removal of capital controls are underway in Tanzania, while Burundi is lagging behind. Tanzania partially liberalized capital transactions in the 1990s, but has not made much progress since then (Annex 1). The Bank of Tanzania, recognizing the risk of opening a capital account, is in the process of formulating a plan for the gradual lifting of capital controls, in accordance with the Common Market Protocol. In Burundi, where capital markets are the least developed, the authorities still have significant control over capital transactions; regulatory frameworks are yet to be established in some areas.

B. Harmonization of Market Infrastructure

In the EAC, the intent to harmonize market infrastructure was evident, even before the establishment of the community. The capital market authorities of Kenya, Tanzania, and Uganda established the East African Member States Securities Regulatory Authorities (EASRA) in 1997, with the objectives of enhancing cooperation among members and advancing the integration of the markets. Rwanda and Burundi later joined the organization in 2008 and 2011, respectively. The Capital Markets Development Committee (CMDC), consisting of chief executives of the regulatory authorities and security exchanges, was established in 2001. It is a standing committee

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[8] For the history of capital account liberalization in the EAC, see IMF (2008) and (2009).

of the EAC, making policy recommendations on regulation and integration of the capital markets.[9]

Cooperation for harmonization is fairly advanced in the EAC, compared to other regional integration arrangements in the African continent (UNECA, 2008; AfDB, 2010a). The EASRA agreed on an approval procedure for cross-border listings in the EAC in 2000 and compiled common debt ratio criteria for those wishing to issue debt securities. The organizations are also taking the lead in taxation of capital transactions, financial reporting standards, trading systems, and financial education. The USE has harmonized its listing rules with those of the NSE, although the number of companies cross-listed at the EAC stock exchanges is only six as of end-2010. Kenya, Uganda, and Tanzania are working toward demutualizing their respective stock exchanges, and merging them into a single regional stock exchange in the future.[10] Regional initiatives are ongoing to integrate payment and settlement systems across the region.

IV. MEASURING CAPITAL MARKET INTEGRATION IN THE EAC

The previous section noted that EAC authorities made salient efforts to integrate their local capital markets. In order to see to what extent their efforts have succeeded, this section measures the degree of capital market integration in the EAC debt and stock markets, employing the methods of beta and sigma convergence and cointegration analysis.

A. Methodology

Beta Convergence and Sigma Convergence

Two concepts have been widely used in the literature to assess integration of capital markets. The first one, beta (β) convergence, is measured by the following regression with panel data:

$$\Delta S_{i,t} = \alpha + \beta S_{i,t-1} + \sum_{l=1}^{L} \gamma_l \, \Delta S_{i,t-l} + \varepsilon_{i,t} \tag{1}$$

where $S_{i,t}$ denotes a spread of yields on a relevant portfolio investment between country i and a benchmark market at time t, and l represents lag. If financial markets are perfectly integrated, this spread should be zero as long as securities traded have the same risks and maturity structures, following the law of one price ("mean reversion"). Therefore, a negative β coefficient indicates mean reversion taking place across the markets, and an absolute value of the coefficient represents the speed of convergence at which the spread is dissolved and investment returns on securities in country i converge with those in the benchmark market. γ_l measure lagging effects from ΔS_i, in previous periods.

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[9] The committee was reorganized into the Capital Markets Insurance and Pensions Committee (CMIPC), with an expanded mandate covering insurance and pension development.

[10] The Rwanda Stock Exchange has been demutualized since its inception.

In this analysis, the benchmark market is assumed to be Kenya, following IMF (2009), given its dominant size and development in the region. Thus the analysis focuses on the spreads of returns between Kenya and the other countries. Three-month lags are uniformly taken, with lags beyond the duration not being statistically significant in any of the estimates.

The second concept, sigma (σ) convergence, employs the cross-sectional standard deviation of yields across countries at each time, calculated as follows:

$$\sigma_t = \left[\frac{1}{n-1}\Sigma\left(R_{i,t} - \overline{R_t}\right)^2\right]^{\frac{1}{2}} \tag{2}$$

where n represents a number of the countries, $R_{i,t}$ represents a return on a portfolio investment in country i at time t, and $\overline{R_t}$ identifies an average return in the region at time t. Regressing the computed sigma on a time trend tells us whether and at what pace the dispersion is decreasing and thus whether financial integration is deepening over time. Perfect convergence is realized when the sigma stays at zero. Beta and sigma convergence capture different aspects of financial integration: while beta convergence measures to what extent integration has been achieved in a fixed time framework, sigma convergence illustrates whether markets are moving toward integration over time. Beta convergence is a necessary, but not a sufficient condition for sigma convergence (Sala-i-Martin, 1996): beta convergence could be associated with sigma divergence.

An extensive variety of empirical studies exists that use these concepts, especially in the context of capital market integration in the European Union (EU). Adam and others (2002) apply these indicators to 10-year bond yields and interbank rates, as well as mortgage rates and corporate loans rates of the EU countries, concluding that EU financial integration has increased, particularly after 1999. Babetskii, Komárek, and Komárková (2008) use these indicators to assess stock market integration of the new EU member states such as Czech Republic and Hungary, and find positive evidence. For other regions, Espinoza, Prasad, and Williams (2010) measure interest rate convergence in the Gulf Cooperation Council (GCC) interbank markets and conclude that there is evidence of integration, although little progress has been made since 2000.

Cointegration Analysis

Another approach widely used in assessing stock market integration is investigating long-run equilibrium of returns among stock markets using cointegration modeling. Specifically, the following error correction model with l lags is considered:

$$\Delta P_t = v + \Pi P_{t-1} + \sum_{i=1}^{l}\Gamma_i\Delta P_{t-i} + \varepsilon_t \tag{3}$$

where P_t is a ($n \times 1$) vector of stock indices at time t, v is a ($n \times 1$) vector of parameters, Π is a ($n \times r$) parameter matrix with rank $r < n$, $\Gamma_1, \ldots, \Gamma_l$ are ($n \times n$) matrices of parameters, and ε_t is a ($n \times 1$) vector of random errors. The essence of the approach is to identify r, a number of cointegrating vectors. If n variables with unit roots have r cointegrating relationships, they have $n - r$ common stochastic trends. Thus if r equals $n - 1$, stock markets are perfectly integrated under one common long-run trend. Alternatively if r equals 0, all data series are independent

(Kasa, 1992). Johansen and Juselius (1990) derive two likelihood-ratio tests to infer on *r*, known as the trace statistics and the maximum-eigenvalue statistics.

A number of empirical studies implement this approach.[11] Serletis and King (1997) and Bley (2010) investigate stock market integration across the EU. Manning (2002), Click and Plummer (2005), and Yu, Fung, and Tam (2010) apply the technique to assess integration of Asian stock markets. However, there has been little empirical work on assessing long-run linkages among African stock markets. To my knowledge, only Wang, Yang, and Bessler (2003) and Adjasi and Biekpe (2006a) conduct the cointegration analysis focusing on African stock markets. The former find no cointegration relationship among five African stock markets (South Africa, Egypt, Morocco, Nigeria, Zimbabwe) and the US market between July 1999 and May 2002. The latter select seven African economies (Egypt, Ghana, South Africa, Mauritius, Nigeria, Kenya, Tunisia) and identify two cointegrations for November 1997 to August 2005.

B. Data

For the EAC debt markets, monthly data on 91-day treasury bill rates for Kenya, Tanzania, and Uganda are retrieved from the IMF African Department database (Figure 2). For Rwanda, weighted average interest rates of 28-, 91-, 182-, and 364-day treasury bills are alternatively used because the data on 91-day treasury bill are available only after 2009. The database consists of data published or reported by the authorities. Burundi has to be dropped from the analysis, because of data unavailability. The data have 440 observations, covering September 2001 to December 2010, when data for all four countries are available. To supplement the analysis on the treasury bill markets, beta and sigma convergence are also measured using monthly data on interbank market rates from January 2001 to December 2010 (480 observations), obtained from the same source (Figure 2). The analysis on the interbank markets enables comparison with the analysis on the same markets in the EU and the GCC, conducted by Adam and others (2002) and Espinoza, Prasad, and Williams (2010), respectively.
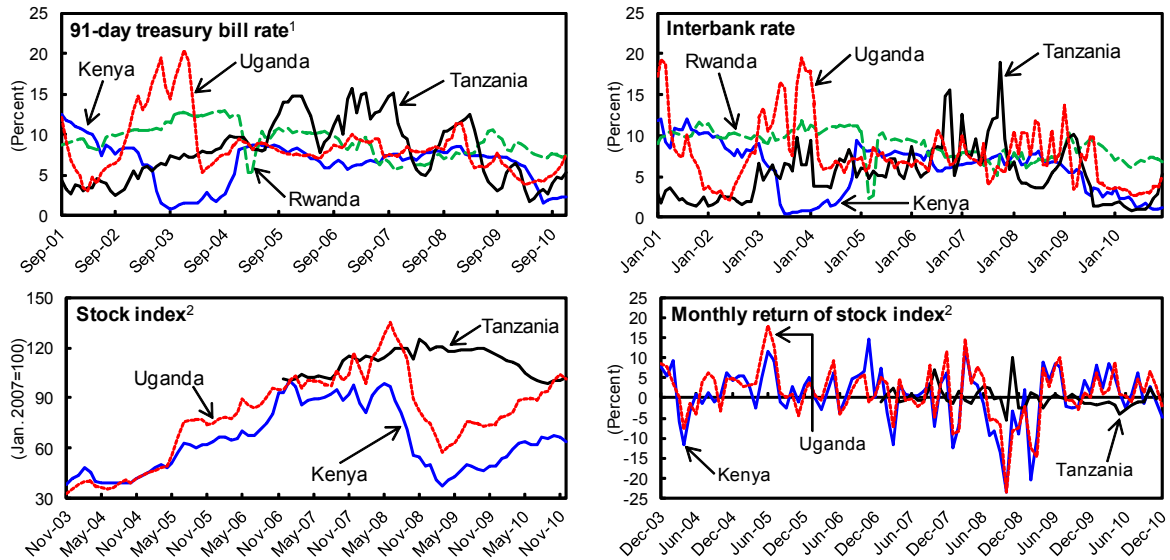
For the stock markets, monthly averages of representative stock indices—NSE 20 Share Index, DSE All Share Index, and USE All Share Index—are computed from daily data retrieved from Bloomberg.[12] Rwanda and Burundi cannot be included in the analysis because the RSE has no stock index with only three companies listed, and Burundi does not have a stock market. The study period is November 2003 to December 2010. DSE All Share Index, however, is available only after December 2006, resulting in 221 observations in total. For this analysis, the stock

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[11] For a literature review, see Sharma and Bodla (2010).

[12] Monthly frequency is adopted taking the low liquidity of the markets into consideration, as shown in Figure 1. In the USE, for example, the number of deals and trading days were only 11 and 8 in November 2003, the beginning of the study period. Using weekly data in such a low-liquidity market is unlikely to appropriately reflect market fundamentals, biasing the analysis. Thus monthly averages with less noise and more information to estimate a long-run relationship are employed in this analysis.

indices are converted to a common currency, using spot rates between the local currencies and the US dollar.[13] Stock returns are computed as the log difference of the indices (Figure 2).

Figure 2. Interst Rates and Stock Indices in the EAC

Source: IMF, African Deparment database; Bloomberg; and author's calculations.

[1] For Rwanda, weighted average rate of treasury bills with maturities of 28, 91, 182, 364 days.

[2] All stock indices are adjusted for exchange rates. Stock returns are computed as the log difference of the indices.

C.   Results

EAC Debt Markets

Beta convergence suggests the existence of a convergence process in the EAC treasury bill markets. The first three columns in Table 6 show the estimated beta coefficients using the panel data with ordinary least squares (OLS), fixed effects, and random effects models. The coefficients are negative and statistically significant, robust to the models of estimation. The estimated beta indicates it takes as long as 9 months before the magnitude of a deviation becomes half of the initial one ("half-life" of deviations).[14] The fixed effects model implies that there is no significant difference in the beta coefficient across the countries. Three columns on the right side of the table present the results of OLS regressions using individual spreads of Rwanda, Tanzania, and Uganda from the benchmark Kenyan market. The results are consistent with those from the panel data regressions except that the beta coefficient for Uganda is not statistically significant.

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[13] Converting to a common currency may not be necessary in relatively advanced financial markets, because investors may hedge foreign exchange risks using forward contracts. It is, however, not necessarily a case for the EAC, because forward markets are at nascent stages of development (Wang, 2010). The cointegration analysis is conducted using data series both adjusted and not adjusted for exchange rates, leading to the same conclusion (discussed below).

[14] The half-life is calculated as $\ln(0.5)/\ln(1+\beta)$.

Table 6. Beta Convergence: Treasury Bill Market

	Panel Regression			Individual Regression		
	OLS	Fixed Effects	Random Effects	Rwanda - Kenya	Tanzania - Kenya	Uganda - Kenya
β	-0.076 ***	-0.077 **	-0.076 ***	-0.054 *	-0.097 ***	-0.057
	(0.023)	(0.023)	(0.011)	(0.022)	(0.027)	(0.041)
γ_1	0.376 ***	0.377 ***	0.376 ***	0.517 ***	0.239 **	0.548 ***
	(0.074)	(0.075)	(0.093)	(0.138)	(0.090)	(0.143)
γ_2	-0.130	-0.130	-0.130 **	-0.037	-0.069	-0.097
	(0.085)	(0.084)	(0.049)	(0.179)	(0.087)	(0.162)
γ_3	0.183 *	0.184 *	0.183	-0.026	0.341 ***	-0.031
	(0.071)	(0.071)	(0.103)	(0.103)	(0.094)	(0.121)
Rwanda - Kenya		0.011				
		(0.178)				
Tanzania - Kenya		-0.045				
		(0.173)				
Constant	0.219 **	0.231 *	0.219 ***	0.204	0.215	0.180
	(0.077)	(0.108)	(0.015)	(0.108)	(0.127)	(0.107)
Observation	324	324	324	102	108	108
R-squared	0.180	0.181	0.181	0.274	0.211	0.287

Source: IMF, African Department database; and author's estimates.

Note: Standard errors are in brackets.

*** denotes significant at the 0.1 percent, ** at the 1 percent, and * at the 5 percent levels.

Beta convergence in the EAC interbank markets, shown in Table 7, also suggests mean reversion taking place: the coefficient is negative and statistically significant regardless of the models used. It also provides an intuitively sensible interpretation that the speed of convergence is faster in the interbank markets (approximately a 6-month half-life) than in the treasury bill markets (approximately a 9-month half-life). Compared to interbank markets in other regions, the estimated speed of convergence is faster than that in the EU interbank markets (23-month half-life) and comparable to that in the GCC markets (half-life ranging from 3.6 to 5.5 months), estimated by Adam and others (2002) and Espinoza, Prasad, and Williams (2010), respectively. The relatively large values of the EAC beta coefficients, however, are due to their large constants: the constants are estimated at above 0.2 in the EAC (although it is not statistically significant), compared to 0.097 in the EU and the range of between -0.077 and 0.033 in the GCC.

Table 7. Beta Convergence: Interbank Market

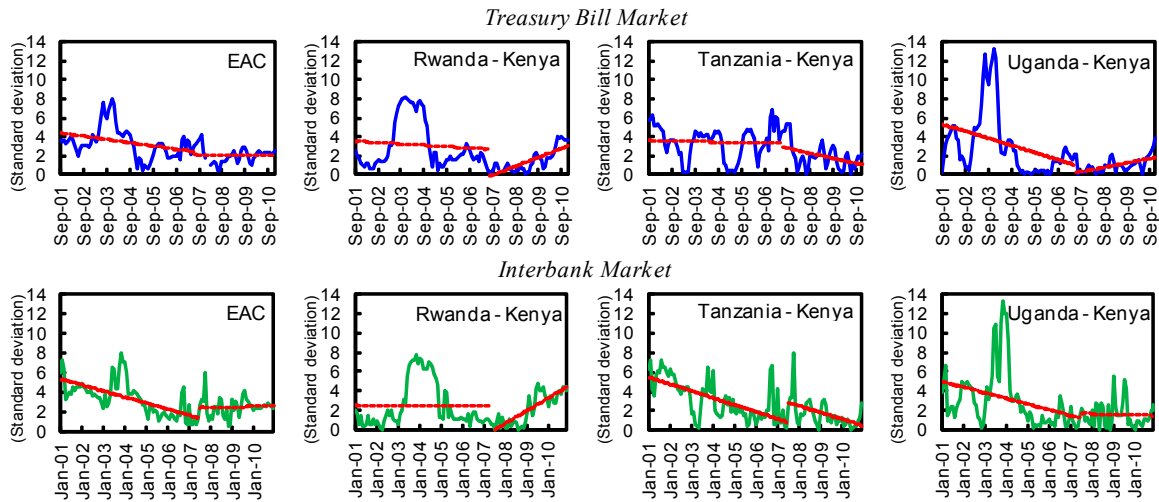|	Panel Regression			Individual Regression		
	OLS	Fixed Effects	Random Effects	Rwanda - Kenya	Tanzania - Kenya	Uganda - Kenya
β	-0.107 ***	-0.119 **	-0.107 ***	-0.085 *	-0.126 *	-0.121
	(0.031)	(0.036)	(0.013)	(0.042)	(0.059)	(0.063)
γ_1	0.100 ***	0.107	0.100	0.111	0.006	0.194 *
	(0.065)	(0.065)	(0.073)	(0.109)	(0.103)	(0.098)
γ_2	-0.230 **	-0.224 **	-0.230 ***	-0.101	-0.208	-0.270 *
	(0.072)	(0.072)	(0.030)	(0.137)	(0.109)	(0.122)
γ_3	0.166 **	0.171 **	0.166	0.002	0.318 ***	0.105
	(0.060)	(0.059)	(0.085)	(0.131)	(0.090)	(0.086)
Rwanda - Kenya		0.181				
		(0.278)				
Tanzania - Kenya		-0.191				
		(0.306)				
Constant	0.175	0.193	0.175 *	0.280	-0.010	0.198
	(0.099)	(0.206)	(0.087)	(0.204)	(0.219)	(0.199)
Observation	348	348	348	116	116	116
R-squared	0.142	0.146	0.142	0.063	0.233	0.169

Source: IMF, African Department database; and author's estimates.

Note: Standard errors are in brackets.

*** denotes significant at the 0.1 percent, ** at the 1 percent, and * at the 5 percent levels.

Sigma convergence reveals that integration of the EAC treasury bill markets has deepened somewhat since 2001, but the progress has stagnated in recent years. Figure 3 shows the calculated sigma convergence in the EAC treasury bill and interbank markets and predicted time trends, using cross-sectional dispersion across the region as well as individual deviations in Rwanda, Tanzania, and Uganda from the benchmark Kenyan market. The figure suggests a downward trend of the dispersion in the EAC markets since 2001; however, the trend has stagnated in recent years, as illustrated by red lines in the figure comparing linear time trends of sigma convergence in the period before July 2007[15] and after. Table 8 shows results of regressions of σ_t on a linear time trend, summarizing the time trends arising in Figure 3. The coefficient of σ_t in the EAC treasury bill markets changed from statistically significant -0.029 before July 2007 to insignificant -0.001 after. These Figure 3 and Table 8 even suggest increasing dispersion in Rwanda and Uganda in the last three years. These findings are largely unchanged for the interbank markets.

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[15] The timing when Burundi and Rwanda joined the EAC is chosen for analysis.

Figure 3. Sigma Convergence: Treasury Bill and Interbank Markets

Treasury Bill Market

Interbank Market

Source: IMF, African Department database; and author's estimates.
Note: Red lines present predicted linear time trends, in the periods before and after July 2007.

Table 8. Sigma Convergence in the EAC Treasury Bill and Interbank Markets: Linear Time Trend

	EAC		Rwanda - Kenya		Tanzania - Kenya		Uganda - Kenya	
	pre July 2007	post July 2007	pre July 2007	post July 2007	pre July 2007	post July 2007	pre July 2007	post July 2007
Treasury Bill Market								
σ	-0.029 ***	-0.001	-0.012	0.079 ***	-0.004	-0.045 *	-0.062 ***	0.039 ***
	(0.007)	(0.013)	(0.011)	(0.010)	(0.010)	(0.017)	(0.014)	(0.011)
Constant	4.632 ***	2.143	3.629 ***	-6.432 ***	3.616 ***	6.427 ***	5.863 ***	-2.905 **
	(0.395)	(1.346)	(0.661)	(0.970)	(0.475)	(1.821)	(0.937)	(1.090)
Observation	110		110		112		112	
R-squared	0.831		0.635		0.796		0.528	
F-test: σ is the same before and after Jul. 2007	3.82 (0.053)		38.92 (0.000)		4.15 (0.044)		30.86 (0.000)	
Interbank Market								
σ	-0.052 ***	0.004	-0.001	0.109 ***	-0.060 ***	-0.057 **	-0.049 ***	-0.005
	(0.005)	(0.013)	(0.008)	(0.008)	(0.008)	(0.019)	(0.009)	(0.011)
Constant	5.389 ***	2.133	2.484 ***	-8.653 ***	5.520 ***	7.351 ***	5.040 ***	2.108
	(0.280)	(1.364)	(0.451)	(0.853)	(0.339)	(2.041)	(0.578)	(1.098)
Observation	120		120		120		120	
R-squared	0.878		0.616		0.814		0.577	
F-test: σ is the same before and after Jul. 2007	16.40 (0.000)		89.80 (0.000)		0.02 (0.902)		9.87 (0.002)	

Source: IMF, African Department database; and author's estimates.
Note: The regressions are estimated with OLS, using the explanatory variable of a linear time trend.
Figures in brackets are standard errors for coefficients and p-values for F-test.
*** denotes significant at the 0.1 percent, ** at the 1 percent, and * at the 5 percent levels.

EAC Stock Markets: Beta and Sigma Convergence

Beta convergence implies mean reversion taking place in the stock markets of Kenya, Uganda, and Tanzania (Table 9). The beta coefficients, estimated at -0.529 in the panel regressions, are negative and significant regardless of models employed. The results suggest surprisingly fast convergence in the stock markets, with less than a month of half-life. The results are robust to

OLS regressions, using the individual spreads of returns in Tanzania and Uganda separately. The individual regressions suggest that integration between the Ugandan and the Kenyan stock markets (0.4 month half-life) is stronger than that between the Tanzanian and the Kenyan markets (one month half-life), although the fixed effects model indicates there is no significant difference in beta convergence between Uganda and Tanzania.

Table 9. Beta Convergence: Stock Market

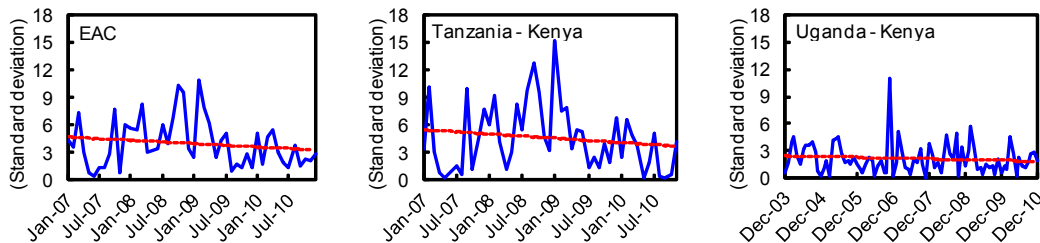|	Panel Regression			Individual Regression	
	OLS	Fixed Effects	Random Effects	Tanzania - Kenya	Uganda - Kenya
β	-0.529 *	-0.529 *	-0.529 ***	-0.484 *	-0.861 ***
	(0.202)	(0.204)	(0.083)	(0.223)	(0.198)
γ_1	-0.120	-0.119	-0.120	-0.055	0.048
	(0.243)	(0.244)	(0.074)	(0.301)	(0.170)
γ_2	-0.205	-0.205	-0.205 *	-0.254	0.171
	(0.201)	(0.202)	(0.086)	(0.238)	(0.149)
γ_3	-0.001	0.000	-0.001	0.058	-0.007
	(0.149)	(0.150)	(0.064)	(0.194)	(0.104)
Tanzania - Kenya		0.035			
		(1.248)			
Constant	0.419	0.402	0.419 ***	0.416	0.608
	(0.581)	(0.603)	(0.041)	(1.059)	(0.466)
Observation	88	88	88	44	81
R-squared	0.359	0.359	0.359	0.372	0.443

Source: Bloomberg; and author's estimates.

Note: Standard errors are in brackets.

*** denotes significant at the 0.1 percent, ** at the 1 percent, and * at the 5 percent levels.

Sigma convergence suggests that integration of the EAC stock markets has stagnated in the past few years. Sigma convergence measures shown in Figure 4 seem to imply that the dispersion of stock returns among the NSE, the DSE, and the USE has slightly reduced over time. However, regressing the estimated σ_t on a linear time trend reveals that the coefficient on σ is not statistically significant, although it has a minus sign (Table 10). These findings do not change if σ_t is computed with respect to the individual dispersion in the DSE and the USE. Looking at individual markets, sigma convergence also shows that dispersion between the Tanzanian and Kenyan markets is larger than that between the Ugandan and Kenyan markets, as shown by beta convergence. These results occur because the Tanzanian stock market was less affected by the global financial crisis than its neighbors' markets (Figure 2), partly thanks to its more stringent regulations on cross-border investments.

Figure 4. Sigma Convergence: EAC Stock Markets

Source: Bloomberg; and author's estimates.

Table 10. Sigma Convergence in the Stock Markets: Linear Time Trend

	EAC	Tanzania - Kenya	Uganda - Kenya
σ	-0.030	-0.039	-0.007
	(0.022)	(0.032)	(0.006)
Constant	4.753 ***	5.571 ***	2.470 ***
	(0.755)	(1.056)	(0.333)
Observation	48	48	85
R-squared	0.026	0.024	0.012

Source: Bloomberg; and author's estimates.

Note: The regressions are estimated with OLS, using the explanatory variable of a linear time trend.

Figures in brackets are standard errors.

*** denotes significant at the 0.1 percent, ** at the 1 percent, and * at the 5 percent levels.

EAC Stock Markets: Cointegration Analysis

Two steps are necessary before conducting the cointegration analysis: (i) verifying whether the data series are nonstationary, containing a unit root and (ii) selecting the number of lags used in the model. For the first step, augmented Dickey-Fuller and Phillips-Perron tests are conducted on the stock price data. The results confirm that all data series are modeled as integrated of order one and appropriate for the cointegration analysis. For the second step, the lag of one is chosen to minimize the Shwartz information criterion. The same results are obtained whether or not the data are converted to the US dollar.[16]

The results indicate that there is no long-run relationship among the EAC stock markets. Given the nonstationarity and the number of lags identified, Johansen's trace tests are implemented to determine cointegration rank. Table 11 indicates there is no cointegration vector in the EAC stock markets. This result is robust if the maximum-eigenvalue statistics are employed instead of the trade statistics and whether the data series are adjusted for exchange rates. Analysis is also conducted using the biweekly data with double the number of observations, resulting in the same conclusion that there is no cointegration vector in EAC stock prices.[17]

Table 11. Cointegration Tests for the EAC Stock Markets

Number of Cointegrating Vectors	Trace Statistics			Maximum-eigenvalue Statistics		
	Adjusted for Exchange Rates	Not Adjusted for Exchange Rates	5 percent Critical Value	Adjusted for Exchange Rates	Not Adjusted for Exchange Rates	5 percent Critical Value
$r = 0$	25.762 *	25.736 *	29.680	17.510 *	20.480 *	20.970
$r = 1$	8.251	5.255	15.410	8.070	5.073	14.070
$r = 2$	0.182	0.183	3.760	0.182	0.183	3.760

Note: * denotes the number of cointegrating vectors suggested by the statistics.

D. Summary and Interpretation of Empirical Results

The results found that beta convergence is taking place in the EAC financial markets. This finding is contradictory to that of the IMF (2009), which finds that convergence is not taking

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[16] The results are available upon request.

[17] The results are available upon request.

place in the EAC treasury bond markets. It is presumably because the IMF (2009) has much smaller number of observations (46), due to the infrequency of treasury bond issues and transactions. Comparing the markets within the region, beta convergence in the stock markets (half-life of less than a month) is much faster than that in the treasury bills markets (about 9-month half-life). This is most likely because investors, especially foreign ones, relatively actively trade stocks at the secondary markets. It should also be noted, however, that two factors need to be taken into account in assessing this finding. First, the result may suffer from a spurious relationship: the estimated beta convergence may partly reflect each market's response to outside shocks, rather than the convergence in the region.[18] Second, the data series may not perfectly reflect market developments, because the numbers of listed companies and transactions are so small.[19] Given that the cointegration analysis indicates there is no long-run equilibrium among the EAC stock markets, estimated beta convergence in the stock markets should not be accepted at face value.

Measured sigma convergence indicates that financial integration has not deepened in the EAC during the past few years, implying that the authorities' efforts at integration have not succeeded in removing financial barriers. The decrease in dispersion before 2007, especially in the treasury bill and interbank markets, is most likely the result of more stable fiscal and monetary policies adopted by most African governments over the past decade, rather than the result of deepened financial integration in the EAC. This trend has stagnated in the midst of the global financial crisis and the political turmoil in Kenya, and some markets are even showing signs of increasing divergence. The persistent dispersion indicates that there exist underlying risks inherent in each country, such as country political risks and foreign exchange risks, which prevent realization of the law of one price.

V. POLICY IMPLICATIONS FOR BETTER INTEGRATED CAPITAL MARKETS

Accelerated efforts are needed to integrate the government debt markets. In Section IV I found that while price convergence is taking place to some extent in the EAC, there is no sign of deepening financial integration in recent years. However, integration of financial markets, in particular government debt markets, is an urgent issue, especially given the ambitious target of starting a monetary union by 2012. Although efforts to liberalize capital regulations and harmonize market infrastructure are moving in the right direction, significant gaps in resources and capacity in member states prevent these efforts from succeeding. That said, a too hasty move

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[18] Consider a case in which a shock outside of the EAC (e.g., a U.S. market) differently affects the EAC markets, widening the spread across the EAC. If the effect of the shock lessens in the next period thereby reducing the spread, it will be counted as stronger beta convergence, although the EAC markets are not converging with each other. This issue is supposed to be more prevalent in the stock markets than in the treasury bill markets, because foreign investors participate more in the stock markets, making the markets more susceptible to exogenous shocks, including those from the global financial crisis.

[19] For stock markets, monthly averages are computed from daily data, taking the low liquidity of the markets into consideration (footnote 11). There is a possibility, however, that the conversion "overkills" the noise in the market. The cointegration analysis is also conducted using biweekly data as mentioned above, with the conclusion unchanged that there is no long-run relationship among the EAC stock markets.
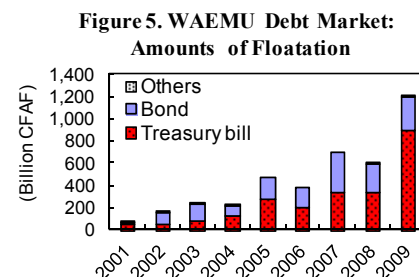
toward fully integrated markets without accommodating the gaps would merely result in inefficient and illiquid markets, hampering the conduct of the monetary union. Relatively small gaps in the EAC government debt markets, illustrated by the existence of functioning markets in all five countries, suggest there is room to further accelerate the efforts at integrating the government debt markets.

Deepening debt market integration is expected to provide positive spillover to other sections of capital markets (World Bank, 2001). Because government debt markets provide a benchmark yield curve fundamental to pricing of financial products, successful integration of the markets will facilitate the development of the entire financial market. Harmonizing market infrastructure, including taxation and enhancing human capital, also will positively affect the financial sector as a whole.

A. Strategies toward Integrated Government Debt Markets

Strategies for integrated government debt markets cover a wide spectrum of options (AfDB, 2010a), ranging from the institution-based approach to the non-institution-based approach. One way is to pursue market integration through institutionally integrating local markets under unified supranational regulations and supervisors ("institution-based approach"). In this case, all local markets are merged into one regional market regulated by a common regional authority. Another approach on the other end of the spectrum is to realize integrated markets with equalized returns on comparable assets across economies through massive cross-border financial flows and cross-listings of securities ("non-institution-based approach"). In this case, each state maintains its sovereignty over its national capital markets while harmonizing regulatory frameworks and market infrastructure, removing barriers to cross-border investment. Actual policy actions take sequences or combinations of these approaches, as argued below.

The West African Economic and Monetary Union (WAEMU)[20] is a good example of broadening regional debt markets through the institution-based approach. Building on the failure of a preceding monetary union (the West African Franc-CFA zone), member countries advanced a number of arrangements to institutionalize autonomous regional organizations that effectively promote integration (Grim, 1999).[21] In the capital markets, a regional securities exchange (BRVM) supervised by a regional securities commission (CREPMF) was established in 1998. A unified auction system to issue treasury bills conducted by a common central bank (BCEAO) was introduced in 2001, along with the gradual elimination and prohibition of advances to governments by the BCEAO. These efforts have resulted in rapidly growing and integrated regional government debt markets, especially

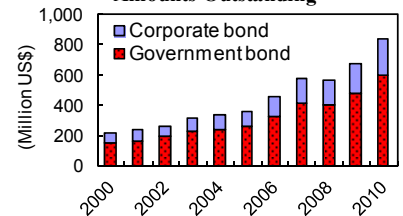**Figure 5. WAEMU Debt Market: Amounts of Floatation**

Source: BCEAO.

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[20] The WAEMU is a customs and monetary union established in 1994, consisting of Benin, Burkina Faso, Cote D'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo. These countries share a common currency, the CFA franc.

[21] The process of integration in the WAEMU was modeled upon that of the EU, except that the member countries had had a common currency of the CFA franc before the monetary union (Claeys and Sindzingre, 2003). Another difference is that well-established local capital markets existed before integration in the EU, rendering the WAEMU a more relevant case for the EAC.

treasury bill markets: the issuance of debt securities has increased by 15 times since 2001 (Figure 5). Frequent cross-border transactions of government securities also occur in the region (Sy, 2007).

For the non-institution-based approach, multilateral initiatives by countries of the Association of Southeast Asian Nations (ASEAN) [22] are a good example. Having experienced the Asian financial crisis in the late 1990s, these countries realize the importance of having well-functioning local currency bond markets and have accelerated regional cooperation, including the Asian Bond Market Initiative (ABMI) under the ASEAN+3 framework.[23] As a result, the size of the markets increased from $218 million outstanding in 2000 to $845 million in 2010 (Figure 6). Although the ASEAN states declared the establishment of the ASEAN Economic Community, including *freer* flow of capital by 2015, their blueprint does not envisage institutionalized integration such as a monetary union or supranational regulatory authority, in keeping with the regional tradition of noninterference. Thus their efforts have been centered on harmonizing market infrastructure and facilitating local currency bond issuance.

Figure 6. ASEAN Domestic Bond Market: Amounts Outstanding

Source: AsianBondsOnline.
Note: Data cover Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam.

The two approaches are not mutually exclusive. While the institution-based approach could anchor the process of financial integration under a fully institutionalized framework, it entails extensive political costs and is time consuming because it requires at least part of national sovereignty to be relinquished. The noninstitution approach could be launched at relatively smaller costs, but it is generally difficult to maintain the momentum because political wills are not embedded in institutional mechanisms, and national interests are not forcefully coordinated. Recognizing these differences, policy makers can and need to deliberately choose their best sequencing or combination from a wide spectrum. Entrenched integration on noninstitutionalized basis is required for smooth transition to institutionalized integration. Even if policy makers start with the non-institution-based approach, at some point they may find it necessary to anchor the process under a more formal framework. In West Africa, vigorous efforts at harmonizing market infrastructure, including accounting practices, started well before the launching of the WAEMU.

There are benefits to the EAC in pursuing both strategies simultaneously. The EAC countries are currently negotiating institutionalized integration under a monetary union. Their political commitment to launch a monetary union and ultimately a political federation seems to imply they will naturally pursue the institution-based approach for integrated capital markets. However, because it takes time to settle the negotiations and to make institutional arrangements operational, they also need to pursue the non-institution-based integration under the current framework, in parallel with the ongoing negotiation toward the monetary union.

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[22] The ASEAN is a regional community established in 1967 by Indonesia, Malaysia, Philippines, Singapore, and Thailand. Brunei Darussalam, Vietnam, Lao PDR, Myanmar, and Cambodia later joined the association, making up the current ten member states.

[23] The ABMI was endorsed at the ASEAN+3 Finance Ministers Meeting in 2003 to develop efficient and liquid bond markets in the region that enable better use of regional savings and investment. The ASEAN+3 includes the ASEAN member states and China, Japan, and Korea.

B. Policy Recommendations

Four common policy recommendations for the EAC can be drawn from the WAEMU and ASEAN experience. These recommended actions will accelerate debt market integration, regardless of whether the process is followed by the institution-based approach as currently negotiated. The WAEMU and the ASEAN are far from perfect examples of capital market integration. The expansion of their regional government debt markets has not led to successful development of corporate bond markets. Stock markets also remain underdeveloped and secondary market activities are still inactive in these regions. In particular, the ABMI has not resulted in tangible market integration, illustrated by the analysis that cross-border bond transaction costs in the region are generally higher than those in the advanced economies (ADB, 2010). Empirical studies also indicate that there is only limited integration of Asian bond markets and stock markets (Manning, 2002; Click and Plummer, 2005; Yu, Fung, and Tam, 2007 and 2010). Nevertheless, because these regions have longer histories of efforts at market integration, useful policy recommendations for the EAC can be drawn from these regions.

Further Harmonize Market Infrastructure, Facilitating Cross-Border Transactions

A unified system for issuing, distributing, and settling debt securities made a significant contribution to the increased volume of issuance and cross-border transactions of government securities in the WAEMU (Sy, 2007). The unification attracted issuers of multilateral institutions (discussed below) and provided more financial products to regional and foreign investors. A number of studies and surveys conducted by the ABMI identified the lack of harmonized trading infrastructure—such as regional clearing and settlement mechanisms, harmonized credit rating systems, and a regional information disseminating platform—as a main obstacle for developing regional bond markets. These inputs led to launching a one-stop clearinghouse of information on regional bond markets, AsianBondsOnline,[24] but many other areas remain to be addressed. In the EAC, while the harmonization of cross-listing rules has been relatively advanced among the existing stock exchanges, more harmonization is needed in a number of areas, including auction mechanisms of treasury bills and establishment of regional clearing and settlement systems. Member states are advised to ensure that any newly-introduced regulations and trading facilities conform to regional standards or best practice.

Strengthen Regional Surveillance Mechanisms

Macroeconomic stability across the region is fundamental in promoting cross-border investments because fluctuating interest rates, inflation, and exchange rates make investment returns unpredictable, creating barriers to cross-border transactions. Sustained growth will increase people's wealth, mobilize regional savings, and attract private investment from inside and outside the region. The WAEMU countries have implemented macroeconomic convergence criteria under a regional surveillance mechanism, backed up by potential sanctions on noncompliant members. The literature suggests that the expansion of the WAEMU government debt market is partly attributable to macroeconomic stability realized under the mechanism

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[24] http://asianbondsonline.adb.org/index.php.

(Bank of France, 2006). The ASEAN countries signed the terms of understanding to establish a surveillance process in 1998 to enhance macroeconomic stability and facilitate regional policy dialogues through peer reviews—the first concrete attempt by a group of developing countries for such purposes. The process is informal and consensus based with no agreed set of macroeconomic targets. Nevertheless, the process is relatively well organized, supported by a high-level Macroeconomic and Finance Surveillance Office set up in the ASEAN Secretariat and a number of regional technical assistance projects provided by the Asian Development Bank (ADB) to strengthen surveillance capacity in the region.

The EAC member states have agreed on a set of convergence criteria as a step toward the monetary union. However, performance has been mixed so far, with the convergence of fiscal deficits excluding grants and inflation persistently exceeding the targets (Table 12). Mechanisms for monitoring countries' performance under the criteria have not been sufficiently articulated and institutionalized to ensure members' adherence to the criteria. The EAC countries could consider assigning the EAC secretariat a formal function of assessing and reporting developments under the criteria, at least for the time being. To do so, it is essential that the secretariat have more capacity to conduct regional surveillance and that economic data submitted by the member states are well defined (ECB, 2010) and more comprehensive.

Table 12. EAC Convergence Criteria

	Primary Criteria[1]		Performance of Member Countries (2010)				
	Stage 1 (2007–10)	Stage 2 (2011–14)	Burundi	Kenya	Rwanda	Tanzania	Uganda
Overall fiscal deficit (excl. grants) *Percent of GDP*	< 6%	< 5%	31.8	7.2	14.0	11.6	7.5
Overall fiscal deficit (incl. grants) *Percent of GDP*	< 3%	< 2%	3.0	6.2	0.4	6.9	5.0
Inflation, period average[2] *Percent per annum*	< 5%	< 5%	6.4	3.9	2.3	10.5	9.4
Foreign exchange reserves *In months of imports*	> 4	> 6	5.2	2.9	4.4	4.8	5.6

Source: IMF, *Regional Economic Outlook: Sub-Saharan Africa, April 2011.*

[1] Secondary criteria include real GDP growth, interest rates, domestic savings, and current account deficits.

[2] Inflation was exceptionally low in 2010 because of benign external environments and good harvests in the region. Inflation rose to about 10 percent on average as of April 2011, driven by hikes in global fuel and food prices.

Encourage Local Currency Bond Issuance by Multilateral Financial Institutions

Countries' economic size and fiscal positions are the most stringent structural limitation in increasing amounts of securities issued in local markets. To address these constraints, both the WAEMU and the ASEAN have intensified cooperation with multilateral financial institutions to encourage their bond issuance in the local markets. As for the WAEMU, the International Finance Corporation (IFC) floated its first local currency bond issue in sub-Saharan Africa equivalent to $44.6 million in the BRVM at end-2006. The West African Development Bank, a regional development bank serving the WAEMU countries, is also an important issuer in the markets, accounting for 6.5 percent of total bonds outstanding in the market at end-2010. In Asia, the ADB issued local currency bonds, being the first foreign issuer in a number of countries

including Malaysia, Philippines, and Thailand. The IFC also issued a series of bonds denominated by Asian currencies. The East Asian countries established funds in collaboration, such as investing pooled foreign reserves in sovereign and quasi-sovereign bonds in the region (Asian Bond Fund) and providing guarantees for local corporate bonds.

Such instruments facilitate integration and development of regional debt markets by issuing high-rated bonds denominated in local currency without influencing countries' debt positions; providing know-how and benchmark transactions for long-term financing; and attracting domestic and international investors. While there is a possibility that large bond issues by these institutions could crowd out government domestic financing, especially in narrow markets of small economies, that risk can be minimized by strong interests of regional investors in investment opportunities and deliberate consultations between governments and issuers on the amounts and timing of issuance. While the East African Development Bank—a regional development bank owned by the EAC countries except for Burundi—issued bonds denominated in Uganda, Kenya, and Tanzania shillings in the mid-2000s, no subsequent issuance has followed since then.[25] Therefore it is beneficial for the EAC countries to launch a study to investigate required actions to promote issuance of local currency bonds by multilateral financial institutions in their local markets.[26]

Build the Capacity of the Existing Regional Institutions

Strong regional institutions are crucial in carrying out the above recommendations, although their roles could be different depending on strategies taken.[27] In the WAEMU, enhanced autonomy and capacity of the regional institutions illustrated by the establishment of the common stock exchange and the elimination of central bank advances to governments is attributed to the acceleration of debt market integration (Bank of France, 2006; Sy, 2007). Although such institutionalized integration has not taken place in the ASEAN, the ADB has played central roles in facilitating regional integration, taking advantage of its relatively high capacity—serving as a secretariat for regional initiatives; providing extensive research and technical assistance; and disseminating information on the regional markets (AsianBondsOnline). EAC organizations such as the secretariat are currently facing significant constraints both with respect to budget and human resources, weakening their capacity to lead the integration process and serve the member states. Thus the authorities could consider enhancing the capacity of the EAC regional bodies that will lead the integration process.

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[25] The amount outstanding stands at $8.6 million as of end-2010.

[26] The IFC was granted approval by the Kenyan authority to issue and list a K Sh3 billion (about $37 million) bond on the NSE in August 2010. There are a number of requirements for multilateral financial institutions to issue local currency bonds, typically including tax exemptions; domestic rating exemptions; broad investor access; risk weighting; and reserve eligibility (Hoschka, 2005).

[27] Under the non-institution-based approach, such roles typically include coordinating members' interests; providing research inputs and technical assistance; and promoting information and technology sharing. In addition to these, regional institutions play roles under an institutionalized framework such as drafting common market rules, monitoring countries' compliance, and implementing sanctions against noncompliers (where such a mechanism exists).

Strengthening regional institutions will also contribute to filling the capacity gap among the member states.

VI. CONCLUSION

EAC capital markets are underdeveloped, although with significant divergence of developmental stages across the region. Whereas government debt markets are functional in all the EAC countries, market size ranges from 2.2 percent of GDP in Rwanda to 27.3 percent in Kenya. Kenya has a relatively advanced stock market for sub-Saharan Africa, while a market just launched in Rwanda and Burundi has no stock exchange. Despite these differences, the countries face the same challenges—low capitalization and liquidity of the markets. Issuers are largely confined to public institutions and foreign-affiliated banks. Investors are dominated by commercial banks and local pension funds, leaving participation of individual and foreign investors limited. These constraints as well as insufficient market infrastructure result in small-sized and illiquid markets of the EAC.

To overcome these challenges, the EAC countries have been actively pursuing regional integration of domestic capital markets by removing capital regulations and harmonizing market infrastructure. Uganda, Kenya, and Rwanda have fully liberalized capital transactions across the region, while Tanzania and Burundi are obliged to do so by 2015. Momentum toward harmonizing capital market infrastructure was evident even before the launching of the EAC; and cooperation is fairly advanced. These efforts achieved some outputs such as a common procedure for cross-border listings, while further progress in wide areas including taxes, financial reporting, trading systems, and financial education is expected.

Despite the authorities' efforts, empirical analysis reveals that capital market integration in the EAC is limited. Estimated beta convergence indicates that the convergence of interest rates and stock returns is taking place among the treasury bill markets of Kenya, Rwanda, Tanzania, and Uganda, and the stock markets of Kenya, Tanzania, and Uganda, respectively. However, sigma convergence analysis suggests that financial integration has not deepened in these markets during the past few years, with some countries even showing signs of increasing divergence. In addition, the cointegration analysis suggests that there exists no long-run cointegration relationship in the EAC stock markets.

Four lessons to accelerate EAC capital market integration can be drawn from the experience of the WAEMU and the ASEAN. First, the member states would benefit from further harmonizing market infrastructure, especially systems for processing security transactions, to facilitate cross-border transactions. Second, the authorities could strengthen regional surveillance mechanisms to ensure members' adherence to the convergence criteria and promote macroeconomic stability across the region. Third, encouraging participation of multilateral financial institutions in the local markets will help the member countries, especially relatively less advanced countries in the region, to develop their local markets, overcoming the constraints of their economy size and fiscal positions. Last, strengthening capacity of the existing regional organizations would help implement the above-mentioned recommendations and make up for the capacity gap among the members.

These recommendations are applicable regardless of whether the EAC countries will pursue the institution-based approach of integration or the non-institution-based approach. The member countries benefit from capital market integration even if the monetary union is not established in the short term. Thus the recommended actions could be carried out separately from the ongoing negotiations on the monetary union protocol. ASEAN's experience clearly illustrates the critical role of governments in advancing capital market integration even under the noninstitutionalized approach.

References

Adam, K., T. Jappelli, A. M. Menichini, M.Padula, and M. Pagano, 2002, "Analyse, Compare, and Apply Alternative Indicators and Monitoring Methodologies to Measure the Evolution of Capital Market Integration in the European Union," Report to the European Commission.

Adelegan, O. Janet, 2008, "Can Regional Cross-Listings Accelerate Stock Market Development? Empirical Evidence from Sub-Saharan Africa," IMF Working Paper 08/281 (Washington: International Monetary Fund).

_____, 2009, "The Impact of the Regional Cross-Listing of Stocks of Firm Value in Sub-Saharan Africa," IMF Working Paper 09/99 (Washington: International Monetary Fund).

Adelegan, O. Janet, and Bozena Radzewicz-Bak, 2009, "What Determines Bond Market Development in Sub-Saharan Africa?" IMF Working Paper 09/213 (Washington: International Monetary Fund).

Adjasi, C. K. D., and N.B. Biekpe, 2006a, "Cointegration and Dynamic Causal Links amongst African Stock Markets," *Investment Management and Financial Innovations*, Vol. 4, pp. 102‒119.

_____, 2006b, "Stock Market Development and Economic Growth: The Case of Selected African Countries," *African Development Review*, 18 (1), pp. 144‒161.

African Development Bank (AfDB), 2010a, *Financial Sector Integration in Three Regions of Africa* (Tunis: African Development Bank Group).

_____, 2010b, *African Fixed Income and Derivatives Guidebook* (Tunis: African Development Bank Group).

African Securities Exchanges Association, 2009, *African Securities Exchanges Association Yearbook 2009*. Available via Internet: http://www.africansea.org.

Asian Development Bank (ADB), 2010, "Estimation of Cross-Border Bond Transaction Costs in ASEAN+3," Part I, *Asian Bond Markets Initiative Group of Experts Final Report*.

Babetskii, I., L. Komárek, and Z. Komárková, 2008, "Financial Integration of Stock Markets among New EU Member States and the Euro Area," *Czech Journal of Economics and Finance*, 57, 2007, No. 7–8.

Bank of France, 2006, "The Rapid Growth of the Government Securities Markets in Sub-Saharan Africa: The Case of WAEMU," *Rapport Zone franc 2006* (Paris: Banque de France).

Bley, J., 2009, "European Stock Market Integration: Fact or Fiction?" *Journal of International Financial Markets, Institutions and Money*, 19, 759−776.

Claeys, A-S, and A. Sindzingre, 2003, "Regional Integration as a Transfer of Rules: the Case of the Relationship between the European Union and the West African Economic and Monetary Union (WAEMU)," prepared for the Development Studies Association Annual Conference, 10−12 September.

Click, R. W., and M. G. Plummer, 2005, "Stock Market Integration in ASEAN after the Asian Financial Crisis," *Journal of Asian Economics*, 16, 5−28.

East African Community, "Treaty for the Establishment of the East African Community." Available via Internet: http://www.eac.int/html.

_____, "EAC Common Market Protocol." Available via Internet: http://www.eac.int/advisory-opinions/doc_download/362-eac-common-market-protocol.html.

Eichengreen, B., and P. Luengnaruemitchai, 2004, "Why Doesn't Asia Have Bigger Bond Markets?" NBER Working Paper 10576 (Cambridge, MA: National Bureau of Economic Research).

European Central Bank (ECB), 2010, *Study on the Establishment of a Monetary Union among the Partner States of the East African Community* (Frankfurt: ECB).

Espinoza, R., A. Prasad, and O. Williams, 2010, "Regional Financial Integration in the GCC," IMF Working Paper 10/90 (Washington: International Monetary Fund).

Feldstein, M., and C. Horioka, 1980, "Domestic Saving and International Capital Flows," *Economic Journal*, Vol. 90, No. 358, 314−329.

Gaertner, M., S. Sanya, and M. Yabara, 2011, "Assessing Banking Competition within the Eastern African Community," unpublished manuscript (Washington: International Monetary Fund).

Grimm, S., 1999, "Institutional Change in the West African Economic and Monetary Union (WAEMU) since 1994: A fresh Start after the Devaluation Shock?" *afrika spectrum*, 34, 1, pp. 5–32.

Hoschka, T. C., 2005, "Developing the Market for Local Currency Bonds by Foreign Issuers: Lessons from Asia," ERD Working Paper Series No. 63 (Manila: Asian Development Bank).

International Monetary Fund (IMF), 2008, *Regional Economic Outlook: Sub-Saharan Africa, April 2008* (Washington: International Monetary Fund).

_____, 2009, "Uganda: Selected Issues," IMF Country Report No. 09/37 (Washington: International Monetary Fund).

_____, 2010a, *Annual Report on Exchange Arrangements and Exchange Restrictions 2010* (Washington: International Monetary Fund).

_____, 2010b, "A Note on EAC Convergence Criteria," unpublished manuscript (Washington: International Monetary Fund).

Irving, J., 2005, "Regional Integration of Stock Exchanges in Eastern and Southern Africa: Progress and Prospects," IMF Working Paper 05/122 (Washington: International Monetary Fund).

Ishii, S., and K. Habermeier, 2002, "Capital Account Liberalization and Financial Sector Stability," IMF Occasional Paper No. 211 (Washington: International Monetary Fund).

Johansen, S., and K. Juselius, 1990, "Maximum Likelihood Estimation and Inference from Cointegration—with Applications to the Demand for Money," *Oxford Bulletin of Economics and Statistics*, 52, 169−210.

Kasa, K., 1992, "Common Stochastic Trends in International Stock Markets," *Journal of Monetary Economics*, 29, pp. 95−124.

Levine, R., N. Loayza, and T. Beck, 2000, "Financial Intermediation and Growth: Causality and Causes," *Journal of Monetary Economics*, 46, 31–77.

Levine, R., and S. Zervos, 1998, "Stock Markets, Banks, and Economic Growth," *American Economic Review*, Vol. 88, pp. 537–58.

Making Finance Work for Africa (MFW4A), 2007, "Financial Sector Integration in Two Regions of Sub-Saharan Africa," Available via Internet: http://www.mfw4a.org/resources/documents/documents-details/financial-sector-integration-in-two-regions-of-sub-saharan-africa-how-creating-scale-in-financial-markets-can-support-growth-and-development.html.

Manning, N., 2002, "Common Trends and Convergence? South East Asian Equity Markets, 1988–1999," *Journal of International Money and Finance*, 21 (2002), 183−202.

Sala-i-Martin, X., 1996, "Regional Cohesion: Evidence and Theories of Regional Growth and Convergence," *European Economic Review*, 40, 1325−1352.

Serletis, A., and M. King, 1997, "Common Stochastic Trends and Convergence of European Union Stock Markets," *The Manchester School* 65(1), 44−57.

Sharma, G. D., and B.S. Bodla, 2010, "Are the Global Stock Markets Inter-linked? Evidence from the Literature," *Global Journal of Management and Business Research*, Vol. 10, Issue 1, 29−39.

Sy, A. N. R., 2007, "Local Currency Debt Markets in the West African Economic and Monetary Union," IMF Working Paper 07/256 (Washington: International Monetary Fund).

United Nations Economic Commission for Africa (UNECA), 2008, *Assessing Regional Integration in Africa III* (Addis Ababa: Economic Commission for Africa).

Wang, Y. D., 2010, "Measuring Financial Barriers Among East African Community Countries," IMF Working Paper 10/194 (Washington: International Monetary Fund).

Wang, Z., J. Yang, and D. A. Bessler, 2003, "Financial Crisis and African Stock Market Integration," *Applied Economics Letters*, 10, 527−533.

World Bank, 2001, *Developing Government Bond Markets* (Washington: World Bank).

World Bank, 2002, *Capital Market Integration in the East African Community* (Washington: World Bank).

Yu, I., L. Fung, and C. Tam, 2007, "Assessing Bond Market Integration in Asia," Hong Kong Monetary Authority Working Paper 10/2007.

_____, 2010, "Assessing Financial Market Integration in Asia—Equity Markets," *Journal of Banking and Finance*, 34, 2874−2885.

Annex 1. EAC: Controls on Equity and Debt Transactions

		Burundi	Kenya	Rwanda	Tanzania	Uganda
Equities	Nonresidents	controls *- Purchases may be effected in foreign exchange or in Burundi francs of lawful origin.*	controls *- Foreign investors are not allowed to hold 60 percent or more of equities of a listed company. East African investors are treated as local investors.* *- Local issuance of securities by nonresidents requires approval of the authority.*	no controls	controls *- Nonresidents are allowed to participate in the market up to 60 percent of total equities issued by an issuer.* *- Foreign companies from the EAC may issue securities to the public and be cross-listed at the stock exchange, subject to approval of the authority.*	no controls
	Residents	controls *- Purchase of foreign securities by residents requires authorities' approval.*	controls *- Sale or issance of securities abroad by residents requries authorities'approval.*	no controls	controls *- Purchase of foreign securities by residents is permitted, provided such equities are acquired by externally generated funds. Such purchase must be reported.* *- Sale or issue of securities abroad by residents requires approval of the authority.*	no controls
Debt Securities	Nonresidents	controls *- Purchases may be made with nonresidents' own foreign exchange funds or in Burundi francs of lawful origin.*	controls *- The same regulations on euiqty apply.*	no controls	controls *- Nonresidents are not permitted to hold government securities.* *- Purchase of bonds on the stock exchange by a foreign investor is subject to a limit of 60 percent of total securities issued by an issuer.* *- Sale or issue of debt securities by nonresidents is not permitted.*	no controls
	Residents	controls *- Sale or issue of bonds abroad requires authorities' approval.*	controls *- The same regulations on equity apply.*	no controls	controls *- Purchase of securities abroad by residents is allowed only if funded fully by external sources and must be reported.* *- Sale or purchase of securities abroad by residents requires authorities' approval.*	no controls

Sources: IMF, *Annual Report on Exchange Arrangements and Exchange Restrictions 2010*; and EAC, *Annex VI to the Common Market Protocol, Schedule on the Removal of Restrictions on the Free Movement of Capital*.