

# IMF Working Paper

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## Measuring Financial Barriers Among East African Community Countries

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**IMF Working Paper**

Monetary and Capital Markets Department

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Authorized for distribution by S. Kal Wajid

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**Abstract**

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This paper seeks to quantify existing financial barriers among East African Community (EAC) member countries based on analysis of each member country's foreign exchange market. The primary contribution of this paper is the generation of an aggregate measure of financial barriers for the three relatively more advanced members (Kenya, Uganda, and Tanzania) using forward foreign exchange and interbank interest rate data. Its empirical results, which are corroborated by other evidence such as the levels of development of the financial markets and restrictions on capital flows, suggest that Kenya is the EAC's most financially open country, followed by Uganda, and then Tanzania. The fact that the three countries exhibit different degrees of financial openness suggests that financial integration in the EAC region has a way to go.

JEL Classification Numbers:

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## I. INTRODUCTION

The countries of the East African Community<sup>2</sup> (EAC partner countries) are aiming for full economic integration. To this end, they have recently ratified the Common Market Protocol and attention is now turning to monetary and financial integration and the negotiation of a Monetary Union Protocol. To achieve financial integration, barriers to international movement of capital across national boundaries would need to be removed. Free capital movement across national borders among countries with different currencies requires the integration of foreign exchange and money markets. Capital movement would be difficult between two countries if the currency of one country cannot be converted into that of the other. A well-established regional foreign exchange market is thus a crucial step towards financial integration.

An integrated financial market is one in which potential market participants face a single set of rules, have equal access, and are treated equally (Baele et al, 2004).<sup>3</sup> For the EAC to have an integrated interbank money market, all banks, regardless of country origin, should have equal access to the money market of every EAC partner country. Given that each EAC country has its own currency, it is essential for the foreign exchange markets of EAC members to function as one market to facilitate integration of the interbank money markets. This paper focuses on the integration of foreign exchange markets and money markets among EAC countries.

It is possible to construct a theoretically sound and computationally easy measure of financial openness based on deviations from covered interest rate parity (CIP). This paper develops such an indicator for Kenya, Tanzania, and Uganda using forward foreign exchange and inter-bank interest rate data for these countries. More precisely, the paper examines empirical deviations from CIP for each of these countries using forward contracts between domestic currency and the U.S. dollar. Burundi and Rwanda are not included here since forward foreign exchange data for these countries is not available.

Deviations from the CIP also imply existence of financial barriers, as opposed to other barriers. In the words of Frankel (1993), “only...CIP is an unalloyed criterion for capital mobility in the sense of the degree of financial market integration across national boundaries.” In addition, some scholars argue that CIP is a necessary condition for perfect capital mobility, and hence deviations from CIP are clear evidence of limited capital mobility

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<sup>2</sup> A community of five countries: Burundi, Kenya, Rwanda, Tanzania, and Uganda.

<sup>3</sup> There are other definitions of financial integration. For example, Deardorff's Glossary of International Economics defines financial market integration as the “freedom of participants in the financial markets of two countries to transact on markets in both countries, thereby causing returns on comparable assets in the two countries to be equalized through arbitrage.” Another characterization of financial integration is in terms of the process of moving toward a single financial market (Decressin et al, 2007). An appropriate definition needs to recognize that there is legal financial integration and effective financial integration—a distinction that will be elaborated later in the paper. This paper uses Baele's definition since it incorporates the above mentioned definitions and characterization.

(Willet et al., 2001). Montiel (1994) gave lack of data as the main reason for not using deviations from CIP as a measure of financial openness for developing countries, especially a lack of forward foreign exchange rates.

Until recently, most empirical studies suggest that CIP holds well in developed markets. Using high frequency data, Akram and others (2008) find that, although deviations from the CIP occur for currency pairs such as dollar-euro, dollar-sterling, and dollar-yen, they are relatively short lived, lasting no more than 15 minutes. Such findings are consistent with the notion that any potential arbitrage opportunity in the forward market would quickly disappear.<sup>4</sup>

During the ongoing global financial turmoil, however, deviations from the CIP have been more persistent in markets such as the dollar-euro market (Sarkar 2009, Baba and Packer 2009, Mancini-Griffoli and Ranaldo 2009). Sarkar (2009) identified a drastic increase in the magnitude of deviations from the CIP in the dollar-euro forward market following the Lehman Brother bankruptcy in September 2008, but did not provide a detailed explanation of the reasons for these deviations. Baba and Packer also identified CIP deviations between dollar and euro over this period and attribute these to differences in counterparty risk between European and U.S. financial institutions. Mancini-Griffoli and Ranaldo (2009) point to liquidity constraints in the dollar money market as the primary cause of the observed CIP deviations. Some scholars contend that CIP violations between currency pairs of developed countries were due to liquidity constraints and heightened counter party credit risk (Coffey and others 2009).

Given that CIP deviations exist even in the most developed foreign exchange markets, one should expect an even higher level of deviations from the CIP among countries such as the EAC countries since their foreign exchange markets are likely exposed to higher levels of counterparty and illiquidity risks and turbulence. Furthermore, transaction costs can be very high in EAC countries. However, these risks themselves can be interpreted as arising from specific forms of financial barrier. Thus capturing them in a financial barrier measure can be useful.

It is also important to note that the forward markets in EAC countries lack depth due to modest levels of cross-country trade in the region and banks' tend not to engage in proprietary trading. The latter might relate to high profitability of other banking activities, which makes trading on the forward market less attractive to banks. Increased financial integration and trade activity among EAC countries and greater competition in the banking sectors might alleviate this in the future.

Deviations from CIP using forward contracts between EAC currencies and the U.S. dollar measures financial openness vis-à-vis the United States. Differences among the EAC members in this respect can be used to infer how far each EAC partner country is from full financial integration with each other. If the EAC is fully integrated financially, all EAC

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<sup>4</sup> Holmes (2000) measures violations from CIP to determine the degree of financial integration in the EU.

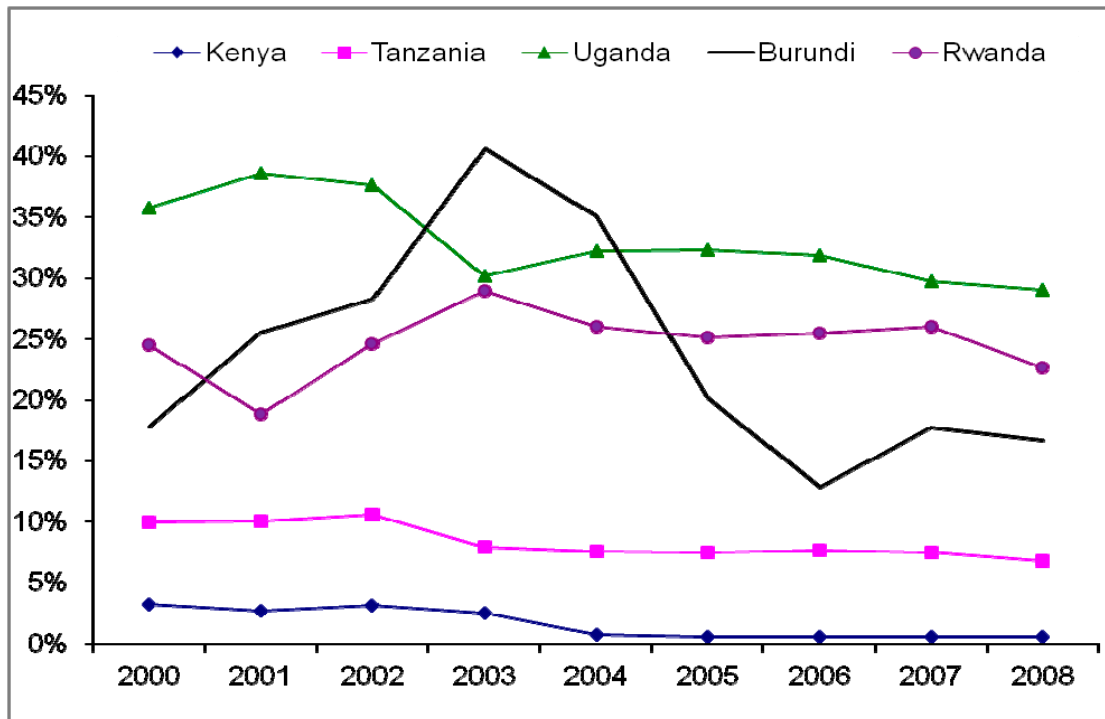
members should converge in terms of their openness vis-à-vis the United States. Data from Kenya, Tanzania, and Uganda suggest different levels of financial openness. Kenya is most open, followed by Uganda, and Tanzania. One can thus infer that financial markets of these countries are not very integrated.

This paper is organized as follows. Section II attempts to gauge intra-regional financial flows by analyzing trade flow data. Section III provides an overview of the foreign exchange markets in these countries, including exchange regulations and restrictions. Section IV explains the use of deviations from the CIP as an aggregate measure of financial barriers, and describes the data sets for Kenya, Uganda, and Tanzania. Section V presents the estimates of the financial barrier proxy for these three countries and also addresses caveats to the analysis. Section VI concludes.

## II. BACKGROUND

At the outset, it is useful to consider the extent to which there are financial flows among the EAC members. Data on such flows are currently not available, but trade flow data may be used as a proxy (arguably a lower bound). Figures 1 and 2 show each country's imports from and export to (in value terms) other EAC members as a fraction of total imports and exports.

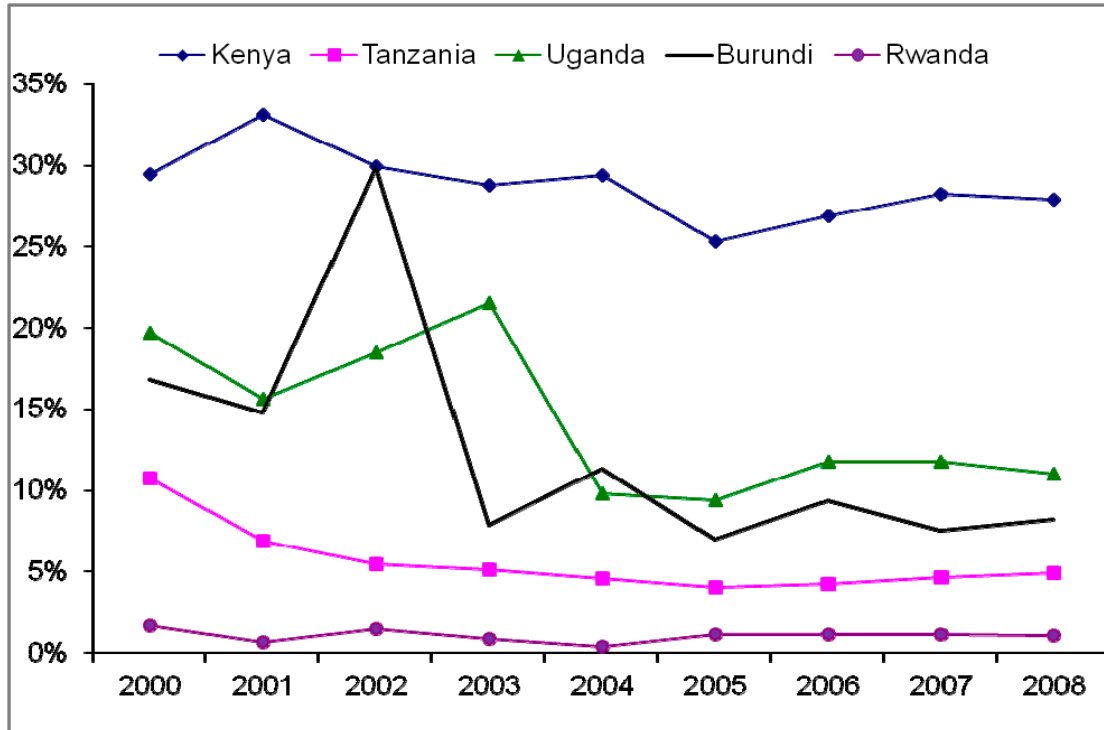
Figure 1. Imports from EAC Members as a Fraction of Total Imports (2000–2008)



Source: IMF, Direction of Trade database; and the authors' estimates.

1/ Trade data cover only goods and do not include services.

Figure 2. Exports to EAC Members as a Fraction of Total Exports (2000–2008)



Source: IMF, Direction of Trade database; and the authors' estimates.

1/ Trade data cover only goods and do not include services.

It is evident from these figures that intra-regional trading activity varies across countries but is significant and most substantial for Kenya. This suggests a commensurate need for foreign exchange among EAC members and it is useful to examine the foreign exchange markets of EAC member countries.

Table 1 presents the absolute size (in U.S. dollars) of total imports and exports of each EAC country in 2008. These data indicate that the value of such trade is modest compared to certain Asian developing countries for example. Since forward transactions in the EAC are mostly trade driven, as banks do not actively trade the forward market, the value of trading in the forward market should be even less than that for imports and exports. One might thus expect deviations from CIP due to the shallowness and illiquidity of the forward markets which are themselves a form of financial barrier. As import and export activities within the EAC increase and competition in the banking sectors intensifies, the depth and liquidity of forward markets would increase and this form of financial barrier would be alleviated.

**Table 1. Import-Export Values of EAC Members<sup>5</sup>  
(2008)**

	Kenya	Tanzania	Uganda	Rwanda	Burundi
Imports	\$12.3Bn	\$6.9Bn	\$3.3Bn	\$1.0Bn	\$0.47Bn
Import/GDP (in percent)	40.8	33.2	22.8	22.6	42.9
Exports	\$5.7Bn	\$1.9Bn	\$1.0Bn	\$0.29Bn	\$0.09Bn
Export/GDP (in percent)	18.8	9.3	7.2	6.5	8.6
GDP	\$30.2Bn	\$20.7Bn	\$14.5Bn	\$4.5Bn	\$1.1Bn

Sources: IMF, Direction of Trade database; and the author's estimates.

The trading volumes of Rwanda and Burundi are much smaller than those of the other EAC members. Since Rwanda and Burundi are also the only two countries in the EAC without forward foreign exchange markets, it is possible that the lack of forward foreign exchange contracts in these two countries is due in part to a lack of demand for such products resulting from the low international trade activities. On the other hand, it is also possible that external trade of Rwanda and Burundi suffers due to the lack of proper instruments for managing foreign exchange risk. Potential reasons for the absence of forward foreign exchange contracts in Rwanda and Burundi are discussed in Section III.

### III. FOREIGN EXCHANGE MARKETS IN THE EAC

This section provides an overview of the foreign exchange markets in each EAC member country in an effort to gain country-specific insights on financial barriers. In particular, it describes certain financial flow restrictions associated with the foreign exchange market of each member country.<sup>6 7</sup>

#### A. Relatively Developed EAC Countries

This subsection discusses financial barriers in the three relatively more advanced countries of Kenya, Tanzania, and Uganda.<sup>8</sup>

<sup>5</sup> Countries are listed in descending order of export volume, left to right.

<sup>6</sup> Given that many features listed below are country specific, it would be difficult to compare the degrees of financial openness of each country based on the descriptions of this section alone.

<sup>7</sup> See Jafarov (2010) for a general overview of existing capital movement restrictions.

<sup>8</sup> The countries are presented in alphabetical order.



## **Kenya**

Kenya's official currency is the Kenya shilling. The foreign exchange market is under the regulation of the Central Bank of Kenya (CBK). The foreign exchange rate policy of Kenya is classified as "managed floating with no predetermined path for the exchange rate" by IMF's 2008 Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). This classification means that, although there is a foreign exchange market in which the exchange rate is determined, there are frequent interventions by the CBK. In addition, the dollar is the principal intervention currency.

Authorized commercial banks and foreign exchange bureaus are licensed to transact in the spot market. There is an interbank (wholesale) spot market and also a retail spot market in which banks and foreign exchange bureaus function as market makers for individuals and businesses. Conditional on approval by the CBK, commercial banks can also enter into forward contracts for foreign exchange. However, foreign exchange bureaus are prohibited from participating in the forward market. There are no legal restrictions on the types of currencies that can be traded in the forward market. However, to date only dollar-shilling forwards are being traded. In particular, there does not appear to be a well-established forward market between the Kenya shilling and any other currency in circulation within the EAC. In fact, there does not appear to be a forward market between any pairs of EAC currencies. Consequently, any hedging of exchange rate risk among EAC currencies is likely carried out through two forward contracts involving the U.S. dollar.

In Kenya's case, discussions with some of the banks reveal that most forwards are entered on behalf of clients who engage in import and export activities. Hence, the level of arbitrage activities in the forward foreign exchange market appears low.

## **Tanzania**

Tanzania's official currency is the Tanzania shilling. The foreign exchange market is under the regulation of the Bank of Tanzania (BOT). Similar to that of Kenya, the exchange rate regime of Tanzania is also "managed floating with no predetermined path for the exchange rate." (AREAER, 2008). Prior to April 2007, the exchange rate regime of Tanzania was classified as independently floating, which implies a low level of intervention from the BOT. Yet, given that the foreign exchange market of Tanzania is a shallow one, the BOT had to regularly intervene, which resulted in the reclassification.

There is an interbank spot market as well as a retail spot market. In addition, authorized dealers (i.e., banks) are allowed to offer forward contracts to their clients on foreign currencies. However, such forward contracts appear to be limited to the hedging activities related to import and export transactions. It is unclear how difficult it is for arbitrageurs and speculators to participate in the forward market, or if such participation is even allowed. At the wholesale level, the BOT does not participate in the forward market in the sense that it does not offer forward cover against exchange rate risks.

In addition, there are several explicit capital movement restrictions that may prevent CIP to hold in Tanzania. For example, borrowing abroad by economic agents and the participation of nonresidents in the domestic money market are restricted (Jafarov 2010).

## **Uganda**

The Uganda currency is the Uganda shilling. The Bank of Uganda (BOU) has the authority to control foreign exchange. Due to Uganda's shallow exchange market, interventions are frequent. As a result, the exchange rate regime of Uganda was reclassified in April 2007 from "independently floating" to "managed floating with no predetermined path for the foreign exchange rate" (AREAER 2005–2008).

There is a forward foreign exchange market in which authorized banks may deal with customers.

## **B. Relatively Less Developed EAC Countries**

### **Burundi**

Unlike the relatively advanced countries in the subsection above, Burundi's foreign exchange market is highly fragmented. Its official currency, the Burundi franc, has more than one exchange rate. In particular, the exchange rate used for official transactions may deviate from the market exchange rate. The Bank of the Republic of Burundi (BRB) sets the official exchange rate daily based on a weighted average of commercial bank rates. Consequently, Burundi does not have a unified foreign exchange market, evidenced by the fact that different commercial banks transact at different spot rates. It is unclear how developed the interbank spot market is in Burundi.

The BRB also exerts greater influence on the fragmented foreign exchange market than Burundi's more advanced neighbors. In particular, the BRB conducts foreign exchange auctions. Prior to the end of 2007, there were significant deviations<sup>9</sup> among the winning bids for any given auction, resulting in an even higher degree of fragmentation in the foreign exchange spot market than we currently observe. Over the past two years, Burundi has been trying to unify its foreign exchange market. Since December 28, 2007, changes in auction rules placed an upper bound of 2 percent on the variations of winning bids for any given auction.

Since the pricing of the forward is closely tied to the spot rate, it is impossible to have a unified forward market without a unified spot market. Allowing forward transactions under such an environment would result in a highly fragmented and chaotic forward foreign exchange market that is difficult to monitor and regulate.

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<sup>9</sup> Greater than 2 percent.

## Rwanda

The official currency of Rwanda is the Rwanda franc. The exchange rate is heavily regulated by the National Bank of Rwanda (NBR). Since the abolition of foreign exchange auctions in June 2007, the NBR has been selling francs at a predetermined reference price, which in effect pegs the Rwanda franc to the U.S. dollar. As the sole primary supplier of foreign currency, the NBR sells foreign exchange directly to banks, which in turn conduct secondary trades in an interbank spot market. At the retail level, the banks (under authorization) can freely set exchange rates in spot transactions with their customers.

A forward exchange market has been authorized, which allows banks to take forward positions on behalf of exporters and importers. Only short-term forwards with a maturity length between 1 and 12 months are allowed at this point. However, given that the Rwanda franc is pegged to the dollar with no indication of moving away from the peg in the near future, there probably is not much demand for forward contracts to hedge the limited variability in the exchange rate. Indeed, despite the formal authorization, the forward exchange market is not yet operational.

### IV. METHODOLOGY FOR GAUGING FINANCIAL OPENNESS

The rationale for the suggested measure of financial openness is intuitive and relies on the covered interest rate parity (CIP). In particular, the CIP states that under conditions of no arbitrage,<sup>10</sup> no counterparty default risk, and no transaction cost,<sup>11</sup> the forward exchange rate between any two currencies should be equal to the spot rate multiplied by the ratio of the interest rates of the two currencies. Mathematically, it can be expressed by Equation (1) below:

$$(1) \quad F = S \frac{1+i_d}{1+i_s}$$

In Equation (1),  $F$  and  $S$  stand for forward exchange rate and spot exchange rate respectively and both are measured in units of domestic currency per 1 dollar.  $i_d$  stands for the interest rate of the domestic currency. Similarly,  $i_s$  stands for the dollar interest rate.

There could be deviations between the left hand side (LHS) and right hand side (RHS) of Equation (1), but for countries that are financially open, the CIP is empirically robust.

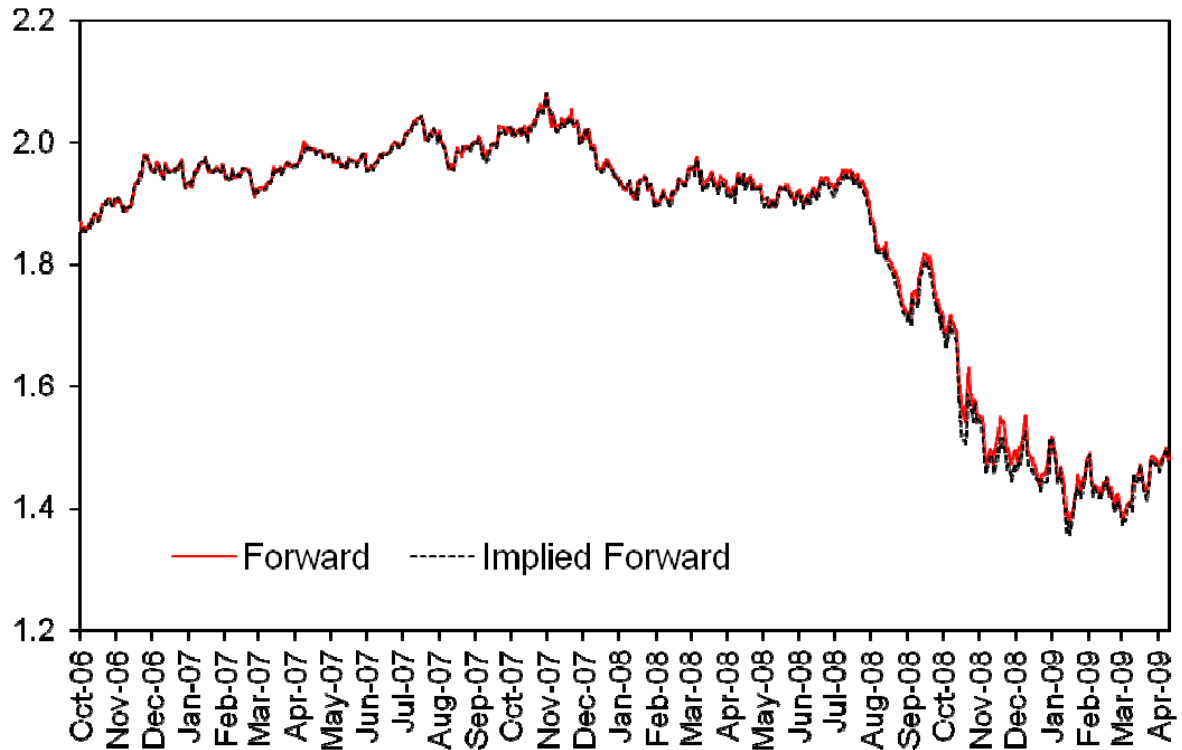
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<sup>10</sup> The no arbitrage assumption is sometimes interpreted as a market efficiency assumption. In an efficient market, market participants do not knowingly ignore arbitrage opportunities. For this paper, “no arbitrage” and “market efficiency” are used interchangeably.

<sup>11</sup> As explained in the Introduction, the no transaction cost and no counterparty risk are both no financial barrier conditions. Transaction cost incorporates both direct costs, such as any artificially imposed conversion tax among currencies, and indirect costs resulting from other financial and capital control measures. Counterparty risk increases the expected cost of financial transactions, which is simply another barrier to financial flows.

Figure 3 illustrates such robustness of CIP between the pound sterling and the U.S. dollar from late-2006 to April 2009 (Wang 2010).<sup>12</sup>

Figure 3. USD-GBP Forwards  
(12-month)



Sources: Federal Reserve Board of Governors (2009), British Bankers' Association (2009), and Bloomberg (2009).

Considering discussion in Section 3, it is unlikely that the CIP between any particular EAC currency and the U.S. dollar is empirically as robust as between the dollar and sterling. The excess deviations, as argued in Section I, can be attributed to the extra financial barriers of each EAC member. Consequently, the discrepancies between observed or actual forward rate ( $F_O$ ) and the CIP-implied forward rate ( $F_{CIP}$ ) can serve as a measure of financial barriers (which includes those caused by counterparty risk and transaction costs).<sup>13</sup> With this in mind, the measure below can serve as a measure of financial barriers.

<sup>12</sup> The choice of using the dollar-sterling market rather than some other market (such as the dollar-euro or sterling-euro market) is completely arbitrary. It is simply one of many empirical evidences for the robustness of CIP among developed countries. Sterling-euro and dollar-euro markets would reflect a similar robustness of CIP.

<sup>13</sup> Transaction costs in EAC countries can be quite high.

$$(2) \quad B = \frac{F_O}{F_{CIP}} - 1$$

$B$  measures the deviation of actual forward rates from the CIP; the greater the  $B$ , the greater the barriers to financial integration. In addition, if  $B$  is negative, then there are more restrictions on inflows than outflows. If  $B$  happens to be positive, then there are more restrictions on outflows than inflows. Finally, a  $B=0$  means no empirical deviation from CIP, which might be a consequence of full financial integration. Yet, as observed in Figure 3, deviations from CIP exist even between countries that are arguably fully financially integrated, which indicates that certain frictions in the financial world might not be fully removed.

When  $B$  is negative, it means that  $F_O \leq F_{CIP}$ . Under the assumption of no financial barrier or capital control, a trader can realize unlimited profit by repeating the strategy of borrowing USD at  $i_s$ , convert it into the local currency in the spot market, save the proceeds with another bank to realize  $i_d$ , and lock in the rate of converting the domestic currency back into USD using the forward market. Notice that this strategy requires converting U.S. dollars into the local currency. When there are financial barriers on inflows, the cost associated with this conversion would increase and consequently result in  $F_O \leq F_{CIP}$  or  $B < 0$ . Hence,  $B < 0$  would suggest barriers on financial inflows. The argument for  $B > 0$  suggests that barriers on financial outflows are symmetrical.

## V. DATA DESCRIPTION

As Equation (1) indicates, to calculate the deviation from CIP, four types of variables are needed for each country: the spot exchange rate between the local currency and the U.S. dollar, forward exchange rates between the local currency and the U.S. dollar for different maturities, interbank interest rates of the local currency, and interbank interest rates of the U.S. dollar. Given that only the three more advanced countries have forward contracts, relevant data for these three countries are presented in this section.<sup>14</sup>

It should be stressed that data reliability is a concern for the available data set on forward rates and interbank interest rates in EAC countries. First, Bloomberg data for EAC members are not frequently updated, which may be due to the shallowness and illiquidity of the forward markets. In addition, the interbank interest rates are spotty, which probably results from a combination of infrequent transactions and poor recording. For instance, limited variance in Bloomberg data raises questions about the integrity of the data set, requiring caution in interpreting such data. As EAC members improve their transaction reporting

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<sup>14</sup> The choice of using the U.S. dollar as the bench mark currency rather than some other major currencies, such as the Euro, is not completely arbitrary. It is a consequence of data availability. Forward prices between EAC currencies and some other major currencies besides the U.S. dollar are unavailable. In fact, it is most likely that forward markets between EAC currencies and other non-USD currencies simply do not exist.

procedures, data quality concerns should diminish and new results using the proposed methodology should be more reliable.

### **A. Spot Exchange Rates**

Figure 4 illustrates the exchange rate (with the U.S. dollar) of the Kenya shilling, Tanzania shilling, and Uganda shilling, respectively, from January 2008 to June 2009. These exchange rates are obtained from Bloomberg.<sup>15</sup> The quoting convention for all three exchange rates is the unit of shillings per dollar.

It is evident from Figure 4 that all three currencies have gone through a period of depreciation against the dollar since June 2008.

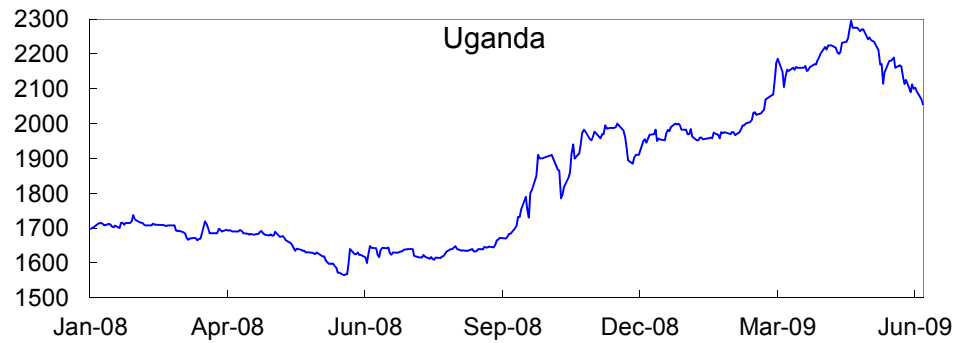
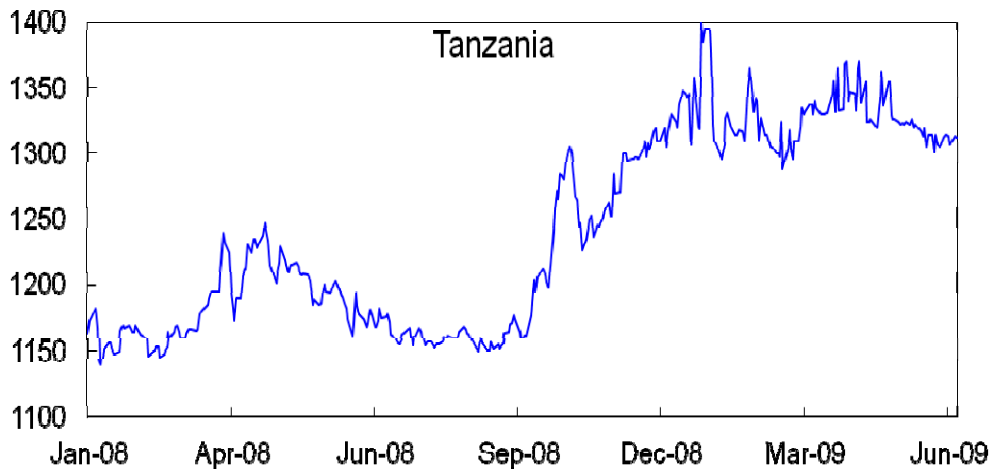
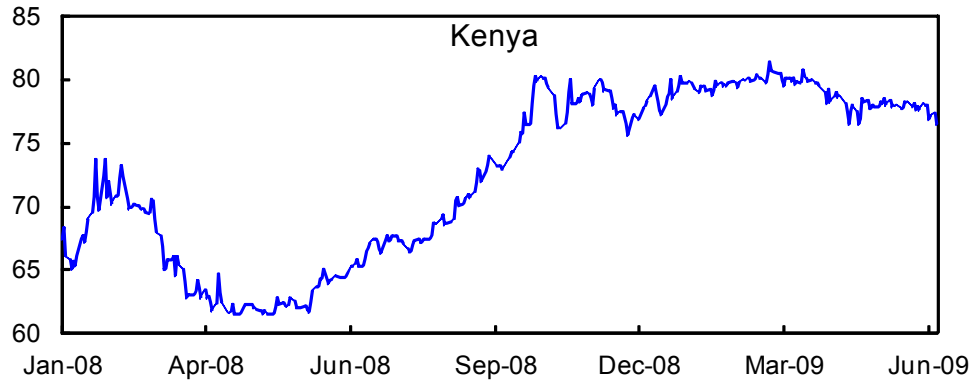
### **B. Forward Exchange Rates**

Interbank forward markets in the three financially advanced countries of the EAC only came into existence very recently and data on forward rates are spotty and difficult to obtain. While forward rates for the three countries can be obtained from Bloomberg, between January 2008 and June 2009, only 49 quotes are reported for any given forward maturity. For each country, there are forward rates with maturities of 1 month, 2 months, 3 months, 6 months, 9 months, and 12 months. They are illustrated by country in Figure 5.

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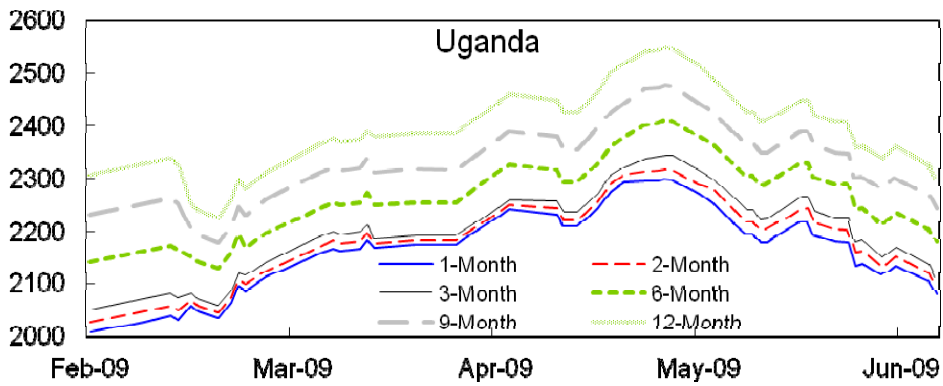
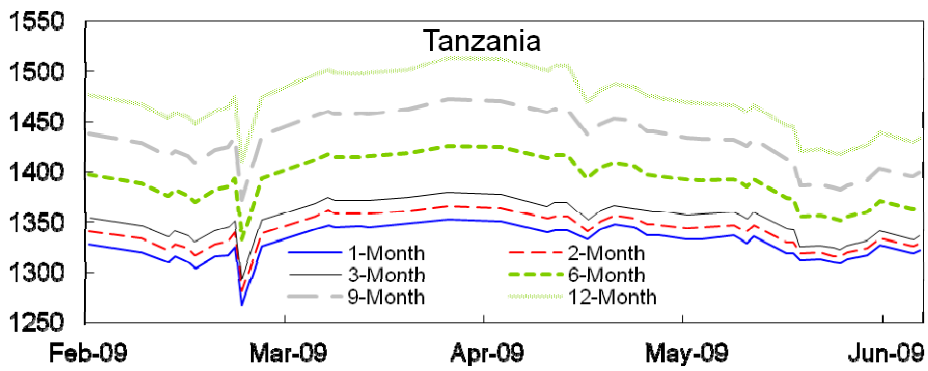
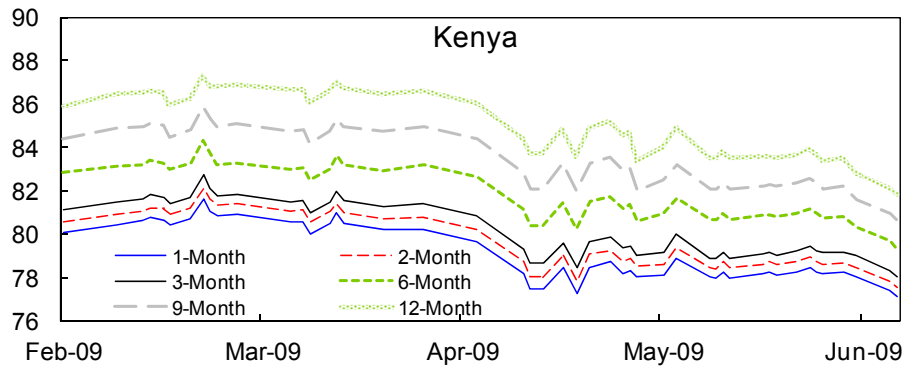
<sup>15</sup> The Bloomberg rates are based on daily transaction rates.

Figure 4. EAC Countries: Spot Exchange Rates  
(January 2008–June 2009)



Source: Bloomberg LP.

Figure 5. EAC Countries: Forward Exchange Rates



Source: Bloomberg LP.



### C. Interbank Interest Rates

The U.S. Libor is used as a proxy for the interbank interest rate of the U.S. dollar. Ideally, an equivalent of Libor should be used for the interbank interest rates of the three types of shilling under study, but data do not currently exist. However, transaction-based interbank deposit rates for the three countries are available from Bloomberg. For Kenya and Tanzania, interbank deposit rates for 1 month, 2 months, 3 months, 6 months, and 12 months are available. The lack of data on interbank deposit rates for 9 months renders the calculation of CIP-implied forward rate for 9-month forwards impossible. For Uganda, only interbank deposit rates for 1 month, 2 months, and 3 months are available. Consequently, CIP deviations using 6-month, 9-month, and 12-month forwards cannot be calculated.

Figure 6 lists the interbank interest rates of each of the three countries from Bloomberg as well as the U.S. Libor obtained from the British Bankers Association. In the case of Kenya, Tanzania, and Uganda, the interbank interest rates exhibit changes infrequently, which may reflect data problems.

### D. Estimation Results

With the data described in the previous section,  $B$  can be generated as described in Section 3. First, Equation (3) below is used to calculate the CIP-implied forward rate.

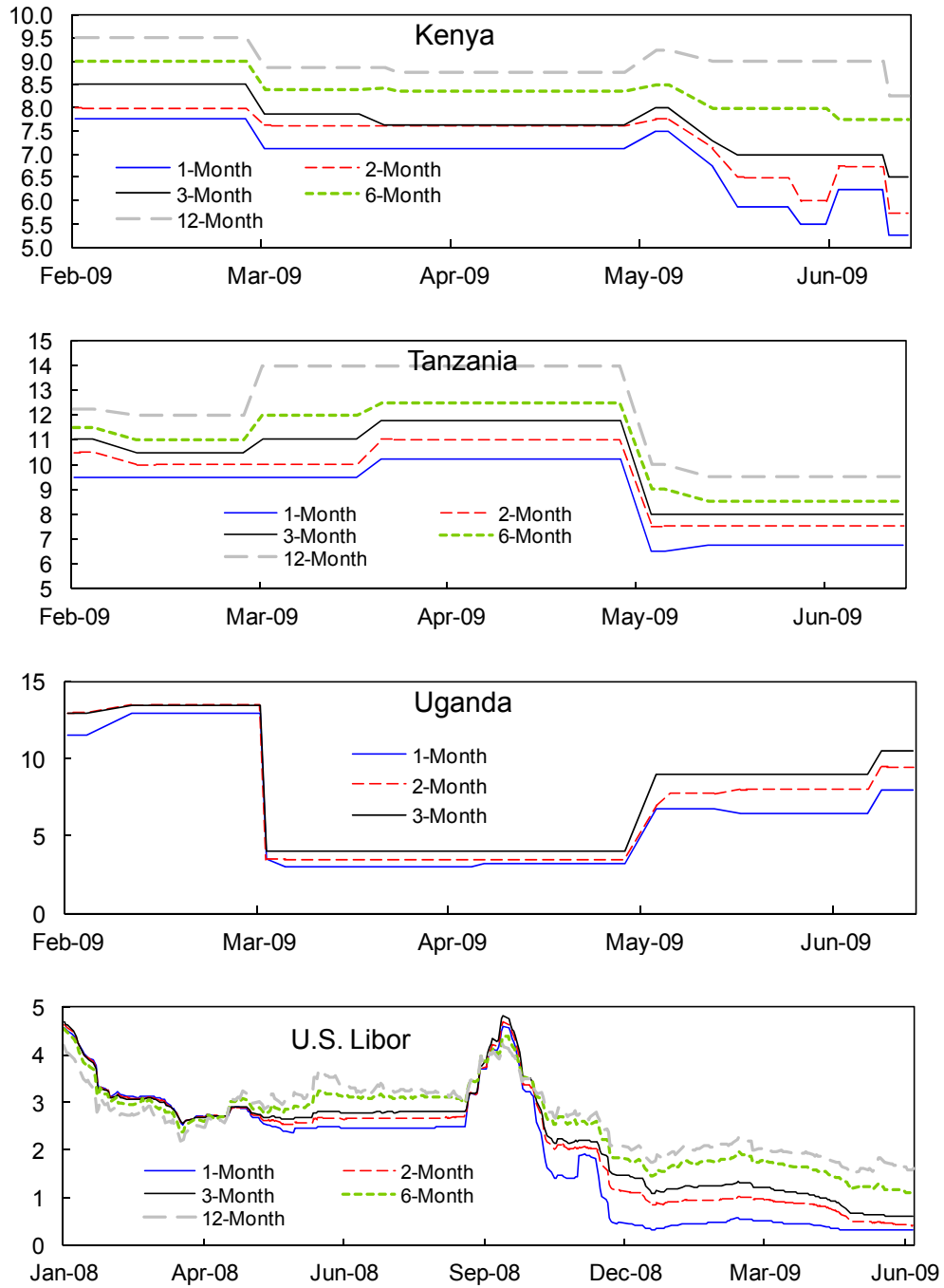
$$(3) \quad F_{CIP} = S \frac{1+i_d}{1+i_s}$$

Then,  $B$  is generated using Equation (2), which is repeated below for ease of reference.

$$(2) \quad B = \frac{F_o}{F_{CIP}} - 1$$

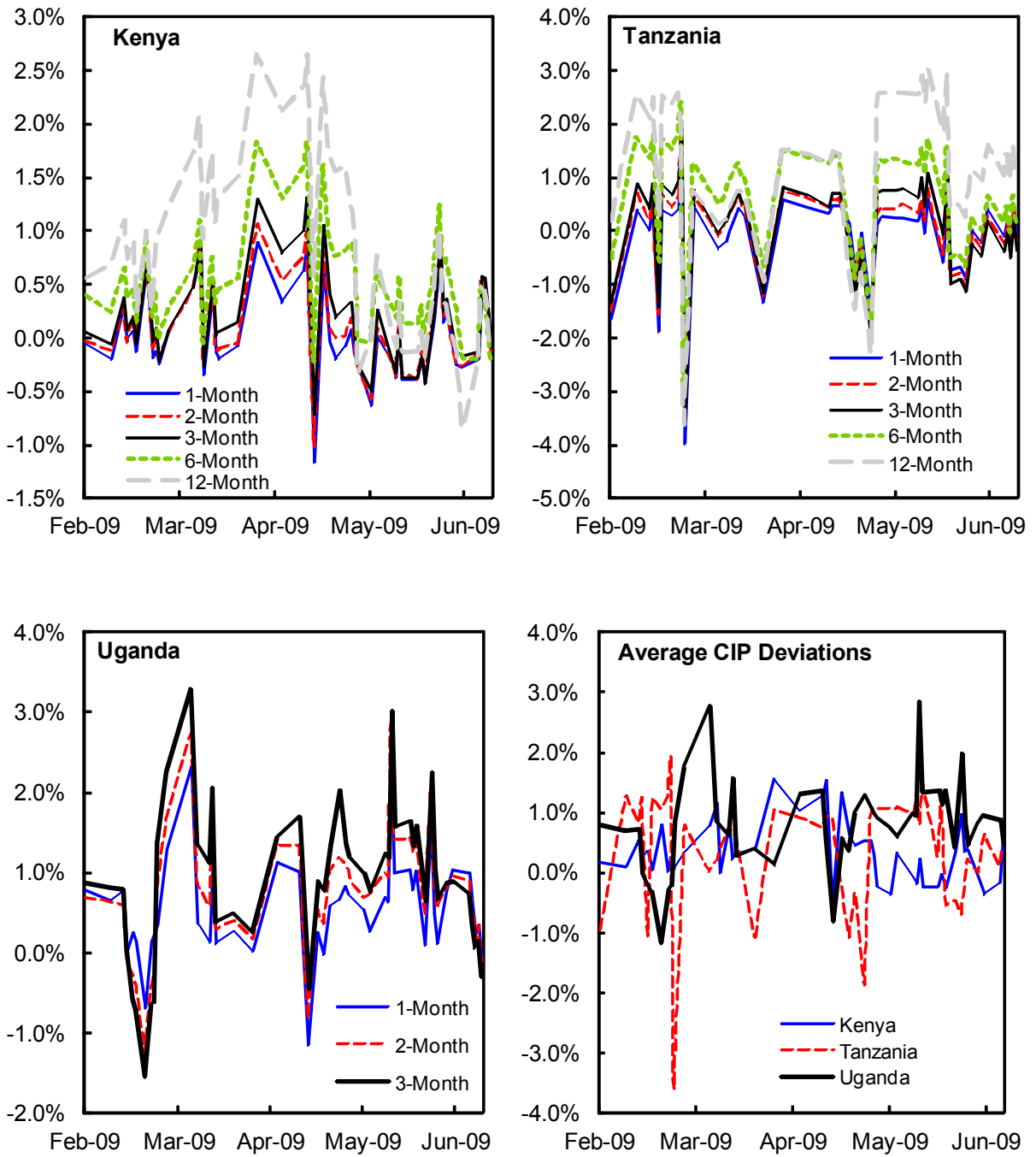
Figure 7 illustrates the results of the estimation of Equation (2) for Kenya, Tanzania, and Uganda, respectively.

Figure 6. EAC Counties: Interbank Rates and U.S. Libor Rate



Source: Bloomberg LP.

Figure 7. EAC Countries: Deviations from the CIP



Source: Author's estimates.

Figure 7 also shows the CIP deviation using data for a particular maturity. The results above indicate that Kenya exhibits the least amount of CIP deviation over this period among the three countries.

For all three countries, CIP deviations appear to be greater with a longer forward maturity. For instance, 12-month forwards show greater deviations from CIP than 6-month forwards, which in turn exhibit greater deviations than 3-month forwards. Such patterns are not particular to the three EAC countries only. For instance, Chinese forwards data from late 2006 to April 2009 demonstrate a similar pattern (Wang 2009), and it is argued that this greater deviation is related to uncertainty about the extent of restrictions<sup>16</sup> in the foreign exchange market. Traders thus tend to charge a higher premium for longer maturities to compensate for the longer exposure to this uncertainty.

To generate a single measure for each country, the arithmetic average of the CIP deviations calculated using different forward maturities is taken. The result is presented in Figure 7.

Table 2 provides summary statistics of the national averages in Figure 7.

Caution is warranted in comparing the mean (or median) of CIP deviations for each country as a measure of financial barriers. The average might not be the best method to generate the financial barrier measure because positive deviations and negative deviations could potentially cancel each other out, resulting in a low average, which would incorrectly generate a financial barrier measure much lower than in reality. In particular, it is the magnitude (rather than the sign) of the CIP deviations that matters when the focus is the degree (rather than the direction) of the financial barriers. Table 3 provides summary statistics of the absolute deviations.

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<sup>16</sup> Such restrictions include conversion restrictions imposed by the government and other financial restrictions.

**Table 2. Summary Statistics of Average CIP Deviations**  
(In percent)

	Kenya	Tanzania	Uganda <sup>17</sup>	United Kingdom <sup>18</sup>
Max	1.55	1.93	2.83	1.06
Min	-0.51	-3.61	-1.16	-0.45
Mean	0.34	0.37	0.78	0.14
Median	0.30	0.74	0.81	0.11
St. Dev.	0.50	1.01	0.76	0.19

Source: Author's estimates.

From Table 3, it is clear that Kenya indeed has the lowest mean and median deviation from CIP (or measure of financial barriers). This suggests that Kenya has the least amount of financial barriers and thus is the country most ready for financial integration out of the three countries. In addition, Kenya's barrier measure also exhibits the lowest level of volatility out of the three EAC countries. Maintaining stability in financial openness is desirable for financial integration, since it reduces the uncertainty economic agents face in conducting cross-country business involving financial flows. The results are also consistent with the stylized observation that Kenya is the most financially advanced and open country among the EAC countries.

Comparing Tanzania and Uganda is more complicated. Although Tanzania has a lower mean of CIP deviations than Uganda, the inequality is flipped when looking at the median. In addition, regardless of whether we look at the mean or the median, the difference is not very large. Also, volatilities of the CIP deviations of the two countries are very close. The analysis suggests that Tanzania and Uganda, although both less open than Kenya, have comparable financial openness vis-à-vis each other, with Tanzania slightly behind Uganda if the focus is on the median and volatility.

<sup>17</sup> Notice that the average CIP deviation for Uganda was calculated using only three series (1-month, 2-month, and 3-month) because Uganda has no longer term forward contracts.

<sup>18</sup> As a comparison reference, also included here are similar statistics of the 12-month sterling-dollar forwards between January 2006 and August 15, 2008.

**Table 3. Summary Statistics of Absolute CIP Deviations**  
(In percent)

	Kenya	Tanzania	Uganda <sup>19</sup>	United Kingdom <sup>20</sup>
Max	1.55	3.61	2.83	1.06
Min	0.00	0.01	0.02	0.00
Mean	0.46	0.88	0.91	0.17
Median	0.34	0.92	0.83	0.14
St. Dev.	0.40	0.60	0.59	0.15

Source: Author's estimates.

While Kenya is the most advanced among the EAC countries, it is still significantly behind developed countries. For instance, Kenya's measure of financial barriers is nearly 3 times higher than that of the U.K.

The different degrees of financial openness relative to the dollar of the three countries suggest that the EAC financial integration in the EAC has a significant way to go. Had the EAC achieved financial integration, this would be expected to be reflected empirically in all member countries exhibiting the same degree of financial openness relative to a third country.

As mentioned in Section I, the CIP-deviation measure has certain drawbacks. In view of the focus on regional financial integration among the EAC members, the ideal measure should be generated by using foreign exchange forward contracts among the EAC currencies rather than forward contracts of each EAC currency and the dollar. However, forward contracts among EAC currencies do not exist. Despite this drawback, constructing and analyzing a measure of financial barriers for each country with the U.S. is useful. If the observed deviations reflect barriers imposed by the EAC countries rather than the U.S., using the U.S. as the common benchmark should allow a quantitative comparison of the barriers in each country.

<sup>19</sup> Notice that the average CIP deviation for Uganda was calculated using only three series (1-month, 2-month, and 3-month) because Uganda has no longer term forward contracts.

<sup>20</sup> As a comparison reference, also included here are similar statistics of the 12-month sterling-dollar forwards between January 2006 and August 15, 2008.

## VI. CONCLUSION

Using data from the forward foreign exchange and interbank funding markets of certain EAC countries, this paper presents a measure of financial barriers for each country. The results show that financial barriers exist within the EAC, and EAC members are significantly less open financially than developed countries. In addition, among the three more advanced EAC countries, Kenya is the most financially open country, followed by Uganda, and finally Tanzania. These results, which should be treated with caution due to data limitations, are corroborated by other evidence such as the stage of development of money and foreign exchange markets and restrictions on capital flows in EAC countries.

Because of a lack of forward foreign exchange contracts, financial barrier measure could not be generated for the two less financially developed countries, Burundi and Rwanda. They probably have greater financial barriers than their more advanced neighbors. Certain prerequisites for a forward foreign exchange market in Burundi and Rwanda are not met. In particular, Burundi needs to unify its fragmented spot market and exchange rate flexibility in Rwanda is lacking.

Efforts can be made by EAC members to remove and lower their existing financial barriers. The fact that EAC countries have agreed to abolish existing capital controls by the year 2015 is a step in the right direction. This should facilitate financial integration within the region along with greater trade. With the removal of capital controls and perhaps other policies to encourage trade among the EAC, the foreign exchange market could grow in size and depth and foreign exchange instruments might also become more prevalent. In summary, coordination among the countries and joint reduction of financial barriers are crucial for a more integrated EAC.

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