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## The Evolving Role of Interest Rate and Exchange Rate Channels in Monetary Policy Transmission in EAC Countries

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**IMF Working Paper**

African Department

**The Evolving Role of Interest Rate and Exchange Rate in the Monetary Policy  
Transmission in the East African Community**

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**Abstract**

With the rapid development and deepening of the financial markets in the East African Community (EAC), it is expected that the effectiveness of monetary policy transmission channels improve over time. This paper finds that this is indeed the case, particularly in Kenya and Uganda where interest rate and exchange rate channels have gained significant prominence over time. In fact, before the recent episode of tightening in Kenya and Uganda, transmission may have been difficult to detect. By focusing on the evolution of transmission over time, the paper highlights challenges in the study of monetary transmission in low income countries and reconciles seemingly contradictory empirical studies conducted over different time periods.

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## I. INTRODUCTION

**The literature on the transmission of monetary policy broadly classifies the standard channels of monetary transmission as the interest rate, exchange rate and credit channels.** Each channel represents a sequence of decisions by firms or households that eventually affect aggregate supply and demand (Mishkin 1996). For example, in the basic interest rate channel, changes in the monetary policy rate or supply of reserves affect the opportunity cost of money, leading to changes in money market rates and —through arbitrage along the maturity curve— long-term rates and hence aggregate demand and inflation. Clearly, a fully-functioning financial system is needed for such a channel to operate effectively. Monetary policy in advanced and emerging markets for the most part operates under these premises.

**For low-income countries (LICs) empirical work faces challenges in identifying the significance and the relative strength of various channels of monetary transmission.** Most of the studies in the literature (Hammond, 2009, Mishra et al, 2010) conclude that the low degree of development hampers transmission in LICs, because the lack of developed bond markets or insufficient access to credit breaks down the links between policy decisions and aggregate demand or supply. However, two alternative explanations are also possible to explain why transmission is found to be weak: (a) the way transmission channels operate in LICs may differ somewhat from the way they operate in more advanced countries (i.e., what the literature normally describes) and (b) inconsistent policies may lead to outcomes that fail to reflect the strength and significance of transmission.

**Another set of recent evidence, however, shows that transmission in LICs maybe stronger than commonly believed.** This suggests that monetary policy transmission may be evolving in LICs thanks to financial development and a more market-oriented approach to monetary policy. IMF (2010) finds that since 1995 central bank discount rates have had a stronger contemporaneous correlation with lending rates in sub-Saharan Africa compared with the Organization for Economic Co-operation and Development (OECD) countries, and that the long-run impact is almost at par with that observed in OECD countries. Bhattacharya (2011) finds strong evidence of an effective exchange rate channel in India using recent data.

**For countries in the East African Community (EAC), the evidence is inconclusive.** Davoodi et al. (2013) highlight the challenge caused by inconsistent policies for the VAR\_based studies of monetary transmission in EAC where instruments such as policy rate and reserve money may exert offsetting expansionary and contractionary effects on inflation. Davoodi et al (2013) also show that transmission is strong in Kenya, though only from policy rate to prices, while it is generally weak in the rest of the EAC for either output or prices. However, other VAR-based studies such as Maturu et al (2010) and Buigut (2010) find evidence of transmission from policy instruments to output. Given challenges faced by VAR-analysis, another set of studies focus on identifying the underlying stages in transmission, such as the

extent of the interest rate pass-through from short to long term rates (Misati et al (2011), Masahi et al (2013)).

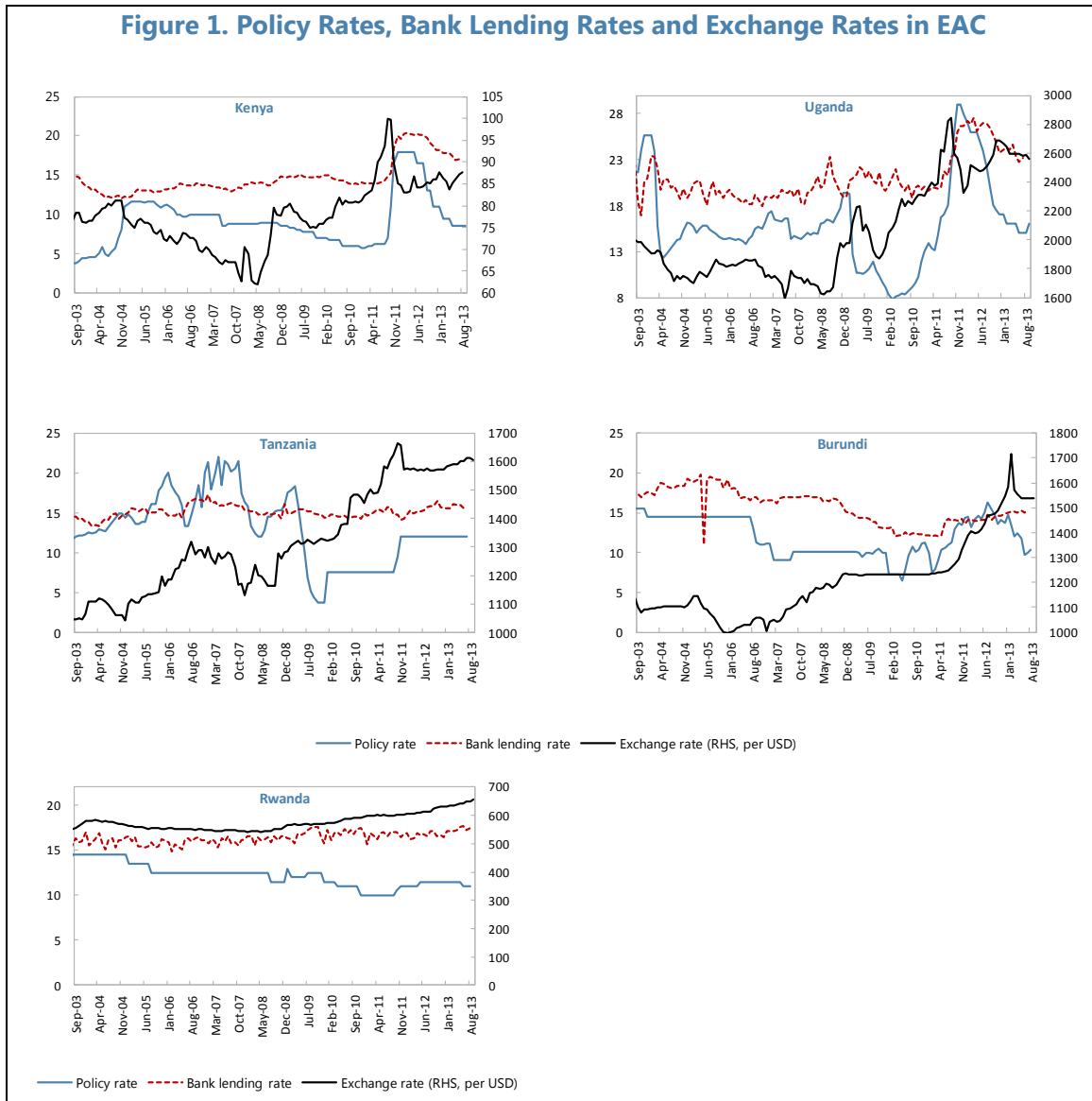
**To address a gap in the literature, this paper focuses on the evolving nature of interest rate and exchange rate channels for the member countries of the East African Community.**<sup>2</sup> The hypothesis is that EAC countries have gone through a process of transformation and deepening of financial markets that has potentially improved transmission over time. We analyze the behavior of transmission over different time periods to identify likely differences in the effectiveness of policy. The contribution of the paper is two-fold. First, we provide a framework that allows us to compare the relative strength of the interest rate and exchange rate channels. This is pertinent for EAC countries in their discussion on harmonizing their monetary policy frameworks before moving to a monetary union. Second, we show that over time the strength of these channels have improved in EAC countries. We use streamlined versions of standard methodologies<sup>3</sup> and apply the same methodology to different sub-periods for all EAC countries in order to identify changes in the pattern of monetary transmission over time. We find that, over time, both the interest rate and the exchange rate channels have gained strength, with differences between countries consistent with their particular macroeconomic and institutional environment. We are also able to show changes in transmission during the recent 2011-12 food-inflation episode, when Kenya and Uganda introduced institutional changes to give a more prominent role to the policy interest rates in monetary policy (Figure 1).

**The paper is organized as follows:** section II discusses traditional channels and their applicability to LIC (and EAC countries). Section III, discusses the empirical findings from applying the selected methodologies to EAC countries, highlighting the improvement of monetary transmission over time in EAC countries. Section IV concludes.

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<sup>2</sup> This study was an input for the study on monetary policy harmonization in the EAC (Morales 2012) .

<sup>3</sup> We use a recursive structural VAR model with Cholesky factorization, augmented by a vector error correction term as in Bhattacharya et al (2011) to jointly assess the interest rate and the exchange rate channels. Also, to assess the impact of money market interest rates on lending and deposit interest rates, we use an Error-Correction Model.



## II. ISSUES ON MONETARY TRANSMISSION IN EAC COUNTRIES

### A. What explains weak monetary transmission in EAC countries?

**Weak monetary transmission in LICs can be explained by weak institutional frameworks, reduced role of securities markets, and imperfect competition in banking sectors** (Mishra 2010). In addition there are reasons to believe that the channels of monetary transmission in EAC countries and LICs in general may not conform to what is analyzed by the standard literature, based on patterns identified in developed or middle-income countries:

- The impact of monetary policy on inflation may be dampened in countries with low levels of international reserves and prone to acute exchange rate swings in periods of instability.
- Supply shocks may have a more significant impact on macroeconomic activity in LICs because of low diversification, blurring the impact of monetary policy on the behavior of economic variables.
- An understandable “growth-supportive” bias in low income countries makes monetary policy prone to “err on the side of being too accommodative”. Related to that, insufficient policy adjustment at times of a surge in inflation may give the impression that policies do not have an impact on inflation and/or economic activity.

In addition, regarding monetary policy transmission in EAC countries:

- Some EAC countries show low exchange rate flexibility (with the exchange rate acting as a de-facto anchor). For these countries, the more relevant transmission is from foreign inflation to domestic inflation.
- Data limitations are still important. For example, only annual GDP information is available in most EAC countries, sometimes for very short periods, which makes it necessary to use proxies for higher-frequency data to assess transmission.
- The use of monetary instruments has been generally uneven across EAC countries.

For these reasons, we opt for an assessment of individual channels rather than a more comprehensive assessment to shed light on how policy affects the behavior of economic agents in EAC countries.

## **B. What transmission channels are relevant to EAC countries?**

A valid question before conducting an assessment in the case of EAC countries is to what extent traditional channels are appropriate representations of monetary transmission in EAC countries.

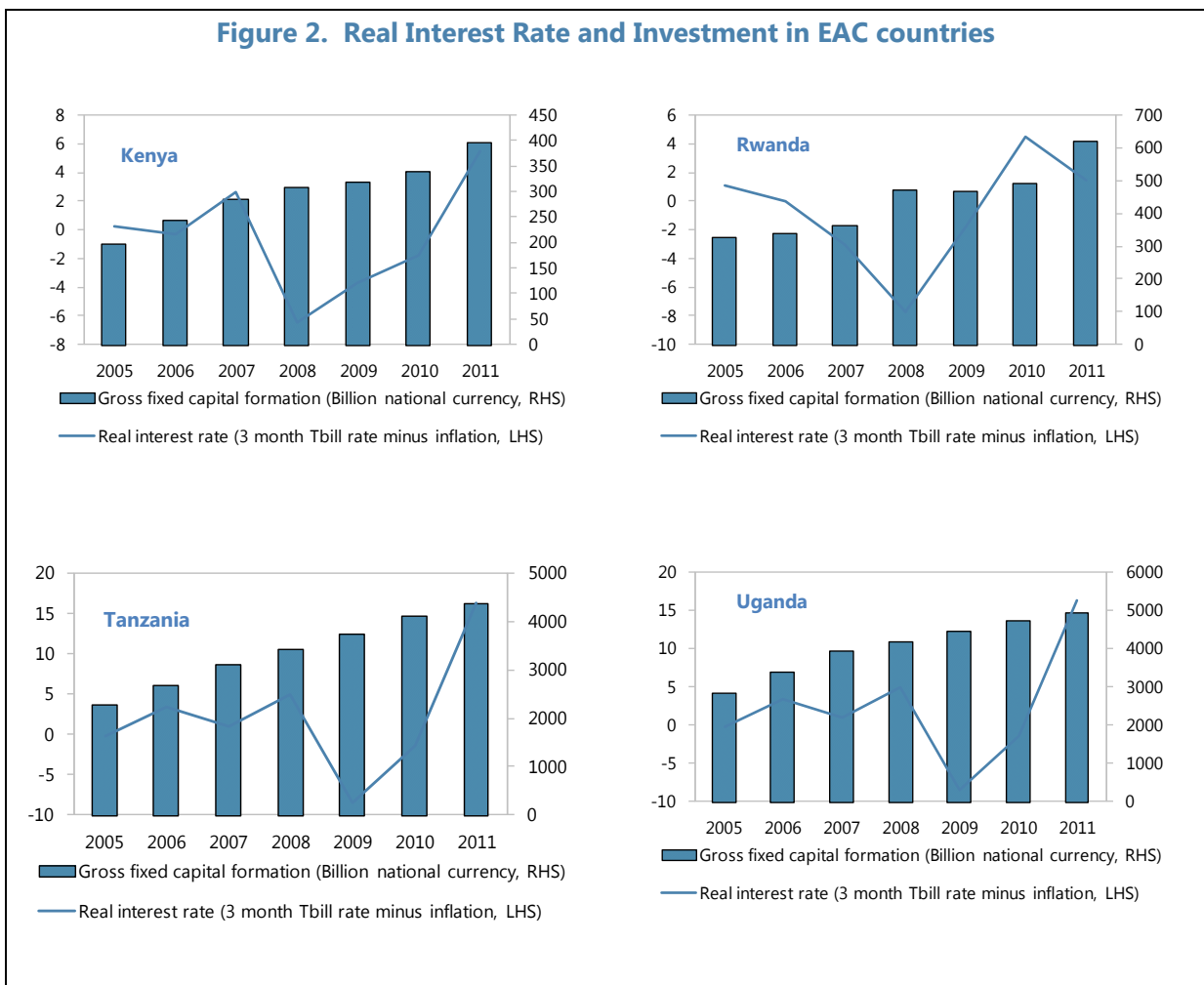
### **Interest rate channel**

**This key channel has been traditionally characterized as follows:** An expansionary monetary policy lowers nominal interest rates, which due to sticky prices in the short term, leads to a fall in real interest rates which in turn lowers the cost of capital, causing a rise in firms’ investment spending and household’s durable goods spending, thereby leading to an increase in aggregate demand.

**The mechanism in its original form is hard to detect even in developed economies.** The premise of this channel is the impact of monetary policy on the cost of capital. Even in

advanced countries, Bernanke and Gertler (1995) argue that it is difficult to identify a significant impact of interest rate on the cost of capital. In LICs (and EAC countries) changes in interest rates are even less likely to have a strong impact on the cost of capital, especially since many other factors (such as cost of doing business and institutional limitations) may have a higher weight in driving the cost of capital over time. In fact, there is no apparent connection between interest rates and investment decisions in EAC countries (Figure 2).

**However, the interest rate channel may still influence expenditure decisions through its impact on bank interest rates.** There is wide evidence for emerging countries that monetary policy has an impact on bank lending and deposit rates (see for example Mojon (2000), Bondt (2002), and Espinosa and Rebucci (2003)). The evidence for LICs is still mixed (Mishra et al. (2010), Misati et al. (2011)).





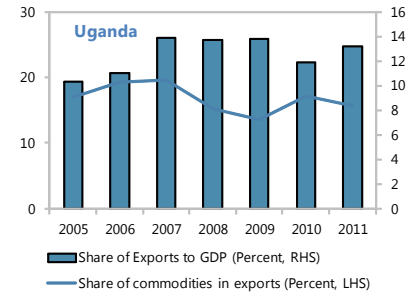
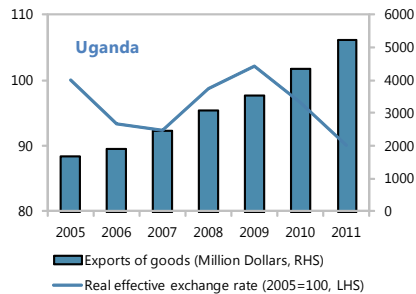
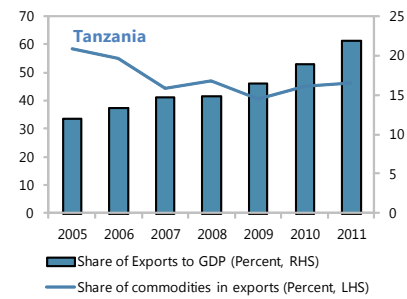
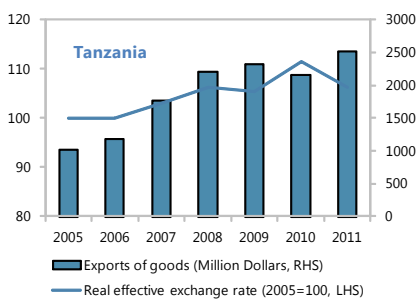
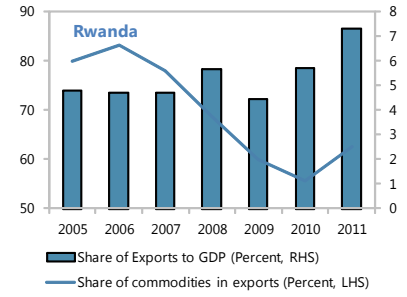
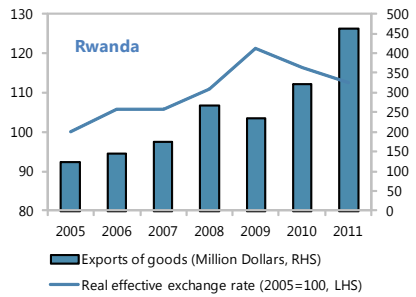
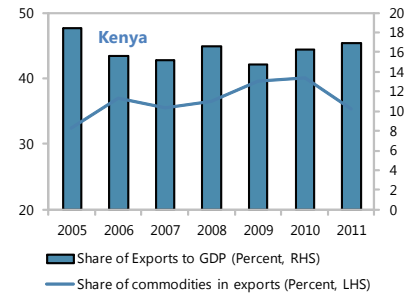
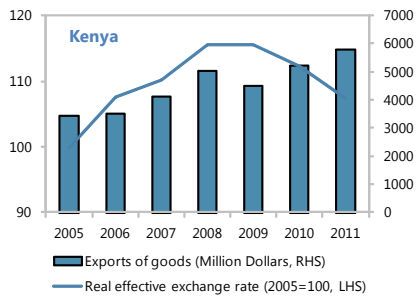
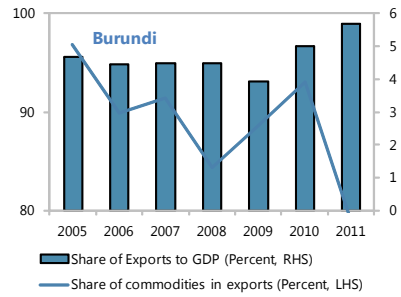
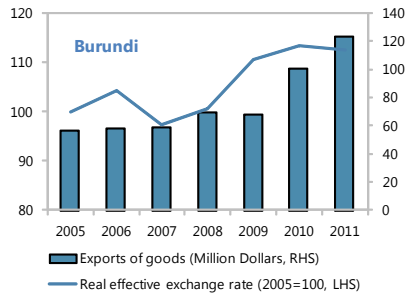
## Exchange rate channel

**This channel has become increasingly important in the literature as more countries integrate to the world economy and more countries adopt floating exchange rate regimes.** The original exposition of the channel can be summarized as follows: an expansionary monetary policy lowers the nominal interest rates on home currency, thereby leading to exchange rate depreciation which in turn should affect export decisions and aggregate output (Mishkin, 1996).

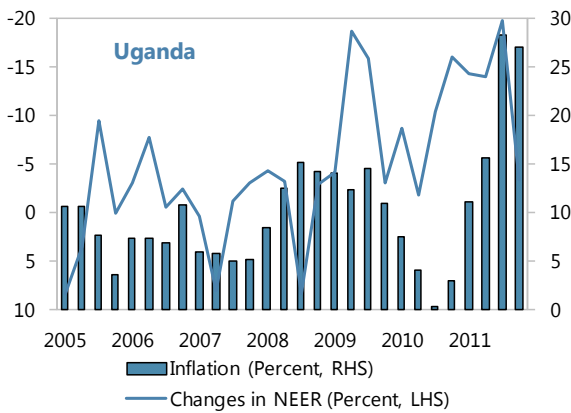
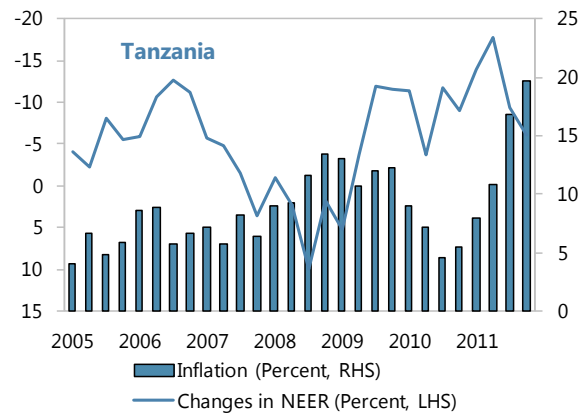
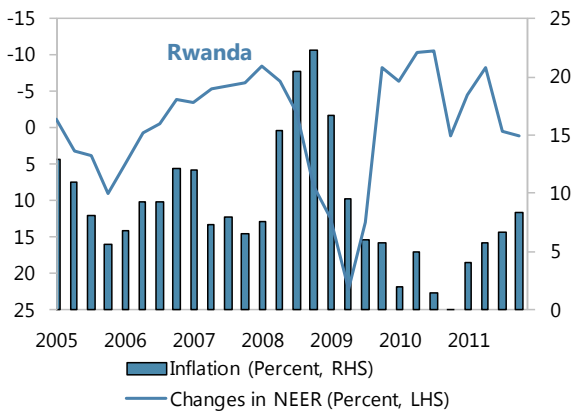
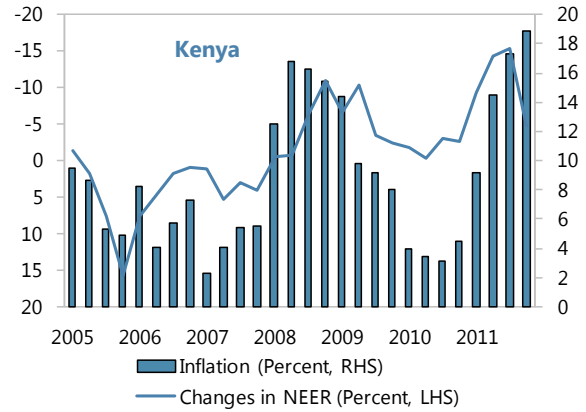
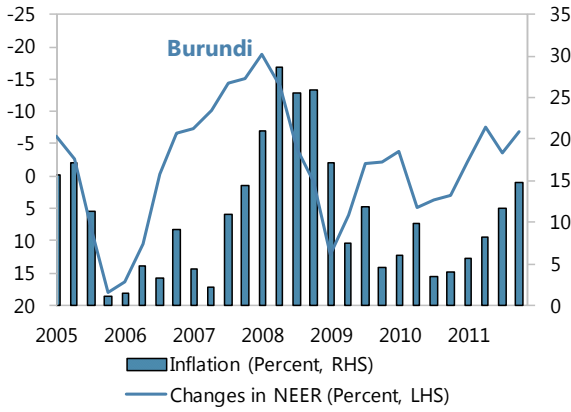
**In the case of EAC countries, capital account regimes and low elasticity of exports may weaken the exchange rate channel as originally formulated:** First, the capital account in some EAC countries is not yet fully open in all cases. Second, main EAC exports are not highly responsive to exchange rate changes (commodities, agricultural exports are still dominant), and they are mainly affected by exogenous and supply factors. Third, low export-to-GDP ratios suggest that the ultimate impact of the exchange rate on economic activity through its impact on exports will be limited (Figure 3).

**However, an alternative version of the exchange rate channel can still be relevant to EAC countries.** As in other LICs, the exchange rate channel in EAC countries seems to be at work mainly through the impact on the level of prices and on inflationary expectations (Figure 4). Some studies find that this channel can actually be more important and significant than the interest rate channel for countries with limited financial intermediation (Bhattacharya et al, 2011 and see Ca'zozzi et al, 2007 for a review of this literature).

Figure 3. Exchange Rate and Exports in EAC countries



**Figure 4. Nominal Effective Exchange Rate Depreciation and Inflation**



### III. ASSESSING MONETARY TRANSMISSION IN EAC COUNTRIES

#### A. A joint assessment of the interest and exchange rate channels

Based on Bhattacharya et al (2011), we use a model that encompasses the interest rate and exchange rate channels to assess the relative significance and strength of both channels. Following McCarthy (1999) and related literature, we use a recursive structural VAR model with Cholesky factorization, augmented by a vector error correction term. The following order of variables is considered: exchange rate, interest rate, output and domestic prices. This ordering is aimed at capturing the characteristics of the EAC countries based on the following rationale: shocks to world variables (oil prices and the US policy rate, which are exogenous) contemporaneously impact the exchange rate. Subsequently, the interest rate affects output and thereby domestic prices.

To capture both the long-run and the short-run relationship, we estimate a vector error-correction model (VECM) that includes a long-run relationship between endogenous variables, detected by co-integration tests. We structure the model as:

$$\Delta y_t = \mu + \alpha \beta' y_{t-p} + A_1 \Delta y_{t-1} + \dots + A_{p-1} \Delta y_{t-p+1} + \delta X_t + u_t$$

Where,

$$y_t = \begin{bmatrix} e_t \\ i_t \\ Y_t \\ P_t \end{bmatrix}, \text{ and } X_t = \begin{bmatrix} \text{Oil price}_t \\ i_t^{US} \end{bmatrix}$$

Here,  $y_t$ , the vector of endogenous variables contains the exchange rate, interest rate, output and price index, and  $X_t$  (exogenous variables) include the oil price and U.S. interest rates.  $\beta$  is the co-integrating vector and  $\alpha$  is the vector of adjustment coefficients.

We estimate the equations for each country using quarterly data in log-linear form (except for the 3-month T-bill rates). The lag-order selection criteria point to 2 lags, so the VECM representation in differences includes one lag. Also the test-statistics of Johansen co-integration point to the existence of one co-integrating vector. We estimate the VECM model for each country over the full sample of 2000 Q1-2011 Q4 as well as over 2006 Q1-2011Q4 in order to evaluate if there are changes in transmission patterns.

#### Regression results

Tables 3 and 4, respectively, report the forecast error variance decomposition (FEVD) results for contribution of changes in each of the endogenous variables on changes in CPI and GDP over different time horizons and for both time intervals. Each row shows the breakdown of contributions from explanatory variables (each row adds up to 100 percent).

- Overall, both the exchange rate and interest rate channels are more significant in recent years in explaining the dynamics of inflation and growth in all EAC countries. By contrast, the inflation inertia plays a lesser role in dynamics of inflation (Table 3). For growth, the explanatory power of interest rate improves for all countries except for Rwanda which shows an even bigger inertia (Table 4).
- Regarding the dynamics of inflation in 2006-2011 (Table 3), the exchange rate explanatory contribution is higher than 10 percent for all countries especially in Kenya and Uganda. However this contribution declines over longer term horizons. By contrast, the interest rate channel seems to be more prominent in the long term.
- The contemporaneous explanatory contribution of the exchange rate to growth is at double digits only for Kenya and Uganda, and it remains high only in the latter. Again, the contribution of the interest rate seems more prominent for longer time horizons except for Rwanda.

The importance of the exchange rate channel in Kenya and Uganda is not surprising. Both countries have relatively open capital accounts, more flexible exchange rate regimes and are relatively less reliant on foreign aid. On the other hand, lower financial development explains the weaker contribution of interest rates in Burundi and Rwanda. Also, Tanzania has a long history of price controls and some capital account restrictions still in place that explain higher inflation inertia.

**Table 3. Analysis of Factor Error Variance Decomposition (FEVD)**

	2000-2011					2006-2011				
	Horizon	Exchange Rate	Interest Rate	Output	CPI	Horizon	Exchange Rate	Interest Rate	Output	CPI
<b>Burundi</b>										
FEVD for CPI	1	6	0	2	92	1	29	14	1	56
	4	13	0	12	75	4	34	16	0	50
	8	13	0	16	71	8	36	14	0	50
	16	13	1	22	64	16	36	14	0	50
<b>Kenya</b>										
FEVD for CPI	1	0.8	1	0.4	98	1	25	28	27	20
	4	0.2	13	17	70	4	6	35	52	7
	8	2.5	16	15	67	8	5	49	41	5
	16	3	18	14	65	16	5	54	38	3
<b>Rwanda</b>										
FEVD for CPI	1	0	0	3	97	1	15	0	19	66
	4	0	0	3	97	4	13	11	32	44
	8	0	0	5	95	8	13	25	36	26
	16	0	0	5	95	16	12	31	38	19
<b>Tanzania</b>										
FEVD for CPI	1	0	6	7	87	1	10	11	8	71
	4	5	1	2	92	4	4	2	3	91
	8	4	1	1	94	8	4	2	1	93
	16	4	1	1	94	16	4	2	1	93
<b>Uganda</b>										
FEVD for CPI	1	0	10	1	89	1	38	1	0	61
	4	4	23	0	73	4	26	47	15	12
	8	3	28	0	69	8	37	41	11	11
	16	2	32	0	66	16	42	22	6	30

Table shows the results of FEVD for changes in CPI for each country and each time period. The contribution of changes in each of four variables (in log form except for interest rate) to changes in log (CPI), add up to 100 percent.

**Table 4. Analysis of Factor Error Variance Decomposition (FEVD) of GDP**

	2000-2011					2006-2011				
	Horizon	Exchange Rate	Interest Rate	Output	CPI	Horizon	Exchange Rate	Interest Rate	Output	CPI
<b>Burundi</b>										
FEVD for GDP	1	0	0	98	2	1	4	4	90	2
	4	11	0	86	3	4	3	66	30	1
	8	14	0	82	4	8	3	79	16	2
	16	16	0	80	4	16	2	87	8	3
<b>Kenya</b>										
FEVD for GDP	1	1	6	91	2	1	25	28	27	20
	4	4	6	73	17	4	6	35	52	7
	8	7	5	66	22	8	5	49	41	5
	16	6	5	71	18	16	5	54	38	3
<b>Rwanda</b>										
FEVD for GDP	1	11	14	74	1	1	0	0	98	2
	4	11	24	57	8	4	3	0	93	4
	8	11	26	53	10	8	2	0	95	3
	16	11	27	52	10	16	1	0	96	3
<b>Tanzania</b>										
FEVD for GDP	1	4	3	91	2	1	2	38	58	2
	4	1	4	82	13	4	1	30	49	20
	8	1	5	81	13	8	0	26	50	24
	16	0	5	81	14	16	0	24	51	25
<b>Uganda</b>										
FEVD for GDP	1	0	1	89	10	1	12	7	80	1
	4	0	12	85	3	4	20	24	49	7
	8	0	18	79	3	8	17	47	30	6
	16	0	26	72	2	16	14	64	16	6

Table shows the results of FEVD for changes in GDP for each country and each time period. The contribution of changes in each of four variables (in log form except for interest rate) to changes in log (GDP), add up to 100 percent.

### **B. A deeper look into the interest rate channel**

Historically, central banks in the region have not utilized the interest rate as an active monetary policy instrument. One of the main considerations for this, has been the apparent disconnect between policy rates and market rates. However, this may have reflected weaknesses in the properties conferred to policy interest rates that may have resulted in self-fulfilling lack of effectiveness. As we have seen, the recent food inflation shock in the region revealed a strong link between central bank operations and behavior of bank interest rates. In fact, some central banks in the region have re-designed their policy frameworks, giving a more prominent role to the policy rates.

In light of this, we conduct an additional test to assess the hypothesis that the interest rate channel operates through their impact on retail banking interest rates. The premise of the interest-rate channel mechanism is that changes in retail banking rates in turn induce changes in aggregate spending.

### Methodology

Following a standard procedure widely used in literature (Misati et al, 2011; Klacso, 2008; Espinosa-Vega and Rebucci; 2003), we use a standard error-correction model (ECM), that accounts for autocorrelations and therefore provides consistent estimates of coefficients. Using the approach developed in Espinoza and Rebucci (2003), we analyze the dynamic, reduced-form relation between retail banking interest rates and money market rates using the following simple Auto-regressive distributed lag (ADL) model:

$$(1) \quad y_t = \alpha_0 + \alpha_1 x_t + \alpha_2 y_{t-1} + \alpha_3 x_{t-1} + \alpha_4 t$$

Where  $y$  is the relevant bank interest rate such as lending or deposit rate, and  $x$  is the money market rate. Following Hendry (1995), equation (1) can be re-parameterized and re-estimated as an ECM:

$$(2) \quad \Delta y_t = \alpha_1 \Delta x_t + \beta_3 (y_{t-1} - \beta_0 - \beta_1 t + \beta_2 x_{t-1})$$

This transformation allows to maintain the same number of parameters, and maps the  $\alpha$  to the  $\beta$  parameters as shown in equation (3) below. As seen in (2), the contemporaneous impact of a change in the market interest rate on the retail rate is  $\alpha_1$ . In this specification, the disequilibrium factor in each period is measured by  $(y_{t-1} - \beta_0 - \beta_1 t + \beta_2 x_{t-1})$ , and  $\beta_3$  measures the speed of adjustment of the retail interest rates to the equilibrium value. The immediate impact is measured by  $\alpha_1 \Delta x_t$ , and the long term impact of transmission to retail rates will be measured by  $\beta_2$ . To derive the adjustment time of the retail interest rates in a response to a change in the market interest rates, we use the mean adjustment lag (Hendry, 1995), given as  $(1 - \alpha_1)/(1 - \alpha_2)$

Where:

$$(3) \quad \beta_0 = \frac{\alpha_0}{1 - \alpha_2}, \beta_1 = \frac{\alpha_1}{1 - \alpha_2}, \beta_2 = \frac{\alpha_1 + \alpha_3}{1 - \alpha_2}, \beta_3 = \alpha_2 - 1$$

By using the links between parameters of equations (1), (2) and (3), we only need to estimate equation (2) for the following variables: bank interest rates (deposit rate, lending rate) and money market interest rates (91-day T-bill rate, interbank rate, and central bank discount rate). We use monthly data covering the period of January 1990 to February 2012.

Cointegration tests point to the presence of a cointegrating relation as modeled above. Simple ADF tests are conducted for individual variables in each country. The tests fail to



reject the null hypothesis of a unit root at one percent level of significance, which means the series are stationary.

### Regression results

Table 5 reports the short-term impact within a month ( $\alpha_1$ ), the long-run impact of monetary policy reflected in ( $\beta_2$ ) and the time it takes for changes in short-term rates to fully translate into changes in retail rates. We estimate the short- and long-term impact of money market rates on average lending and deposit interest rates, using the 91-day T-bill rate and the discount rate as explanatory variables for each country:

- For the full sample period (1995M1-2012M2), deposit rates are more responsive to changes in the discount rate across all EAC countries in the short term, showing short-term elasticities of between 10-20 percent.<sup>4</sup> Except for Rwanda, the long-term elasticity appears sizable, between 50-80 percent. The adjustment period seems to be between 4 to 7 months.
- For lending rates, in the same period, the contemporaneous pass-through of both the discount and the treasury-bill rate is significant only for Kenya and Tanzania. Short-term elasticities appear somewhat lower than that of deposit rates. By contrast, the long-run elasticity is closer to 1 for both countries, and the adjustment period is longer than that of deposit rates.

Table 6 shows the short and long run elasticities for more recent time periods. In particular, we narrow the sample period to observations from 2000 to assess if interest rates sensitivities increase. In order to highlight the developments during the recent period of tightening, the first column excludes information for 2011M6-2012M2.

- The most notable observation is that the lending rate elasticity appears significant in Uganda only when the recent tightening episode is included. By contrast, Tanzania does not show significant elasticities for the recent sample periods. For Kenya, the results remain broadly significant, especially when the recent tightening episode is included. Results for Burundi and Rwanda remain non-significant.

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<sup>4</sup> Data on deposit rates is not available for Burundi.

**Table 5. Monetary Transmission in EAC: Interest Rate Channel (1995-2012)**

1995M1-2012M2										
	x y	Discount rate				x y	Discount rate			
		Lending rate					Deposit rate			
	Burundi	Kenya	Rwanda	Tanzania	Uganda	Kenya	Rwanda	Tanzania	Uganda	
Contemperanous impact	0.087	0.166***	0.017	0.104***	0.038	0.173***	0.122**	0.110***	0.217***	
Long-run impact	0.63	1.09	-0.04	0.72	0.36	0.79	0.10	0.61	0.54	
Adjustment time (months)	4	10	2	15	4	4	7	7	4	
Observations	169	165	178	205	205	165	182	205	205	
R-squared	0.122	0.197	0.268	0.127	0.181	0.363	0.085	0.267	0.157	

	x y	Tbill rate				x y	Tbill rate			
		Lending rate					Deposit rate			
	Burundi	Kenya	Rwanda	Tanzania	Uganda	Kenya	Rwanda	Tanzania	Uganda	
Contemperanous impact	0.034	0.168***	-0.070	0.113***	0.069	0.220***	-0.026	0.110***	0.196***	
Long-run impact	0.35	1.05	-0.04	0.83	0.40	0.83	0.13	0.61	0.65	
Adjustment time (months)	4	8	1	13	4	5	6	6	4	
Observations	155	205	102	205	205	205	100	205	205	
R-squared	0.124	0.258	0.508	0.146	0.184	0.424	0.131	0.248	0.162	

Contemperanous and long term impacts and adjustment times are estimated from coefficients of the regression explained in this section.  
X represents money market rates and y represents retail rates.

Source: IMF; International Financial Statistics; and IMF staff estimates.

**Table 6. Interest Rate Channel in EAC in Different Timeframes**

	2000M1-2011M6	2000M1-2012M2
<u>Burundi</u>		
Lending rate		
Contemporaneous impact	0.107	0.074
Long-run impact	0.55	0.45
Deposit rate		
Contemporaneous impact		
Long-run impact		
<u>Kenya</u>		
Lending rate		
Contemporaneous impact	0.143***	0.154***
Long-run impact	0.38	1.28
Deposit rate		
Contemporaneous impact	0.075	0.180***
Long-run impact	0.46	0.57
<u>Rwanda</u>		
Lending rate		
Contemporaneous impact	0.015	0.015
Long-run impact	-0.08	-0.09
Deposit rate		
Contemporaneous impact	-0.031	-0.029
Long-run impact	-0.11	-0.09
<u>Tanzania</u>		
Lending rate		
Contemporaneous impact	0.01	0.01
Long-run impact	0.33	0.33
Deposit rate		
Contemporaneous impact	0.051	0.054
Long-run impact	0.4	0.4
<u>Uganda</u>		
Lending rate		
Contemporaneous impact	0.062	0.104***
Long-run impact	0.26	0.39
Deposit rate		
Contemporaneous impact	0.247***	0.266***
Long-run impact	0.33	0.48

Contemporaneous and long-run impacts of changes in discount rate on bank lending and deposit rate based on regressions specified in this section.

Source: IMF; International Financial Statistics; and IMF staff estimates.

#### IV. CONCLUSIONS

Overall, we find reasonable evidence for the existence of interest rate and exchange rate channels of transmission of monetary policy in the EAC. We try an original approach that differentiates the sensitivity to changes in money market rates of inflation, output and market interest rates in different time periods, to how the strength of monetary transmission has evolved. We find that, over time, both the interest rate and the exchange rate channels have gained strength, with differences between countries consistent with their particular macroeconomic and institutional environment. This is not surprising as in the recent decade, EAC countries have gone through significant changes in monetary frameworks and financial development. Even in countries with imperfect financial markets, the exchange rate channel proves a strong vehicle translate monetary policy decisions into changes in expenditure patterns.

We highlight the case of Kenya and Uganda in 2011, two countries that redefined the role of the policy rate in the conduct of monetary policy, giving it more prominence. The significant tightening following a food-inflation shock that year had a strong impact on their exchange rate and money market rates. Uganda's example illustrates the difficulties in assessing monetary policy effectiveness in LIC in the presence of prolonged periods when policy delays or inadequate responses distort statistical evidence.

These findings have implications for the choice and mix of the optimal monetary policy in response to inflation. Monetary policy does have an impact on inflation, although it seems less suitable to fine-tune fluctuations of GDP in EAC countries. In conducting monetary policy, EAC countries may consider giving an enlarged role to their policy interest rates, increasing the flexibility of their exchange rates, and using market interest rates to inform their policy decisions in order to move steadily toward a more forward-looking monetary policy framework.

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