Inflation in Africa, 1960-2015

Philip Hans Franses
Eva Janssens

Econometric Institute
Erasmus school of Economics

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Abstract

We present various stylized facts about annual CPI based inflation in 47 African countries. Some stylized facts concern time series properties for each of the series but also across series. To achieve a useful and relevant dataset, we impute all missing values in the sample 1960-2015 using a new method based on postage stamps prices. This results in a balanced panel of annual figures from 1960 to and including 2015 for 47 countries.

The key conclusion from our tour around various data properties is that differences across the country-specific series are substantially larger than their common properties. These differences concern features like peak inflation rates, years of peak inflation, correlation with worldwide inflation figures and country-specific persistence. In one word, there is no such thing as "African inflation", and we recommend that models for inflation in an African country should be designed one by one. When we correlate inflation features in a cross section with country-specific conditions, we see that more democracy, less corruption, and less religious fractionalization associate with lower inflation rates,

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Address for correspondence: Econometric Institute, Erasmus School of Economics, Burgemeester Oudlaan 50, 3062PA Rotterdam, the Netherlands, franses@ese.eur.nl

"Just touched down in Africa with @ChelseaClinton. Excited to travel for next 10 days to @ClintonFdn projects. #Africa2013"

Bill Clinton, Twitter 31 July 2013

"There's no reason the nation of Africa cannot and should not join the ranks of the world's most prosperous nations in the near term, in the decades ahead. There is simply no reason"

U.S. Vice President Joe Biden speaking at the 2014 U.S.-Africa Leaders' Summit

"Africa is a nation that suffers from incredible disease"

U.S. President George W. Bush, during a speech in Goteborg, Sweden, June 14, 2001.

"While we are of course perfectly aware that American cities are very different from African villages, …"

Alesina and La Ferrara (2005)

Introduction

Africa consists of 54 countries and hence 54 economies. Each of these countries has its own particular history and most likely a particular future. Degrees of urbanization differ, and there is variation in economic activity, in climate, in ethnic composition, well in fact, in about anything. To some, however, Africa is a single country, as suggested by the quotes above, but in reality of course, it is a continent, see Reader (1998) for a beautiful biography.

The continent at the same time is huge. The Mercator projection often used by mapmakers causes one to underestimate the sheer size of the continent. Look for example at the following numbers.

Country	Area (in 1000 kilometers squared)
United States of America	9629
China	9573
Brazil	8518
India	3287
Total	31007
Africa	30221

Evidently, four large nations approximately fit into the continent, see also Figure 1.

Zooming in on a few other large countries, consider the following numbers

Country	Area (in 1000 kilometers squared)
France	633
Spain	506
Sweden	441
Japan	378
Germany	357
Total	2315
Algeria	2382
Democratic Republic of Congo	2345

Hence, five large industrialized countries with strong economies fit into either Algeria or the Democratic Republic of Congo.

When modeling and forecasting economic data for African countries, it is quite common to focus on a group of countries, like for example the countries in Sub-Saharan Africa (SSA) or the so-called CEMAC countries. CEMAC, that is, the Central African Economic and Monetary Community, was established in 1994 and consists of Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea and Gabon. At the same time, it is also quite common to look at averages of economic data across African countries, or to include the data into panel data models. Note that due to often-encountered data limitations, these panel data models typically concern unbalanced panel models, which means that for some countries there is more data than for other countries.

Our present paper is on annual inflation based on the Consumer Price Index (CPI), and for this particular variable, we observe the same features. There are various studies on inflation in Africa, and several of those studies use panel models. Usually one relies on an unbalanced panel model, as there are various missing data points, sometimes even within a sample (think of the missing inflation figures for Rwanda in 1994 and 1995). Various studies just analyze average inflation, where typically the unweighted average is considered. Alper, et al. (2016), for example, analyze average inflation for all countries in Sub-Saharan Africa jointly. Unweighted average inflation is also computed and analyzed in Bleaney and Francisco (2016). Caceres, et al. (2012) take the CEMAC countries together and include them into a single panel model, thereby suggesting that these six countries have common properties in one dimension or another. Note that none of these studies takes into account the different sizes of the economies.

A key question of course is to what extent inflation data across African countries have something in common and this question we address in our present paper. This can shed light on the question whether the approach of modeling this variable jointly for multiple countries is indeed justified. To give away the main conclusion, the answer to the question is that, basically, they have not much in common. This paper looks at a variety of properties of inflation data, like basic statistics as the mean, median and peak values, but also autocorrelations, persistence and relations with inflation data of other countries. Three African countries have witnessed hyperinflation in the period 1960-2015, and these are Angola, the Democratic Republic of Congo and Zimbabwe. Other countries have moderately sized inflation levels, and some countries have inflation data that mimic those of western countries.

Before we turn to our detailed data analysis, we first take a closer look at the availability of the data. When studies rely on panel models, they often at best consider unbalanced panels, see for example Ndoricimpa (2017) and Lopes da Veiga et al. (2016), or these studies cover panel data models with a limited time dimension, like for example Barugahara (2015) who analyzes the sample 1985-2009.

The title of our paper refers to 1960-2015, but only for a few countries (think of Morocco, South Africa and for example, Nigeria) the World Bank can provide us with annual inflation figures over this time span. For almost all countries there are missing data, often further away in the past, but sometimes also more recently (for example Libya in 2014 and 2015). As we want to study autocorrelation patterns, and predictability of one country's inflation rate to another country's rate, we seek to establish a complete data set. For that purpose, we will rely on a recent simple data imputation method that relies on the prices of a single product, that is, postage stamps (Franses and Janssens, 2016). Correlating the available inflation data with changes in postage stamps prices often shows a close fit, and with the availability of postage stamps prices for the year with missing inflation figures, we can provide estimates for inflation. We could have used alternative imputation methods, like simple interpolation or averaging, but those methods have an impact on data features like autocorrelations and cross correlations. Furthermore, interpolation is often not a feasible alternative as mostly past inflation data are missing. We could also have used the data of neighboring countries, but that would have an effect on cross-country correlations. In the end, with our method, we thus will have a complete inflation data set for 47 countries for the years 1960 to and including 2015.

The outline of the rest of our paper is as follows. First, we create a full dataset. Then, we study the properties of the data for each of the countries individually. We learn that the properties vary substantially, and it seems that the annual inflation rates do not have much in common. There are also little associations with worldwide inflation patterns. Next, we look at the properties per country and see if there any variables that can explain those properties, where these variables are for example corruption, democracy and urbanization. It follows that more corruption and less democracy associate with higher inflation levels.

The main conclusion is that there is no such thing as African inflation. In fact, we document a range of rather idiosyncratic patterns, shocks, and events. As our best recommendation, we suggest that modelers construct forecasting models for inflation for each of the African countries separately. This is also quite common for Western countries, like the UK (http://www.bankofengland.co.uk/publications/Pages/inflationreport/default.aspx) or the

USA (https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/historical-data/inflation-forecasts). There simply is no reason to put all African countries into a single basket and push them through a single model.

Data

For averages and median values, perhaps an unbalanced data set will work sufficiently well, where unbalanced means that not all data are available for all years. However, it is our goal in this paper also to use techniques like Principal Components Analysis (PCA), Granger causality and cross-country correlations, and in that case it is preferable to have a balanced data set, where all data are available for all countries.

In the Data Appendix, we explain in substantial detail how we estimate the missing data. The main idea is the following. When they are available, we use the annual CPI based inflation figures, reported by the World Bank. When they are not available, we insert for the missing data the estimates that we obtain from the following regression model, that is

$$\text{inflation}_t = \alpha + \beta_1 \text{inflation}_{t-1} + \beta_2 \text{inflation}_{t-2} + \gamma_1 \text{stamp}_t + \gamma_2 \text{stamp}_{t-1} + \gamma_3 \text{stamp}_{t-2} + \gamma_4 \text{stamp}_{t-3}$$

where "stamp" refers to the percentage change in the median postage stamp prices issued in various years. For many countries, and looking at the overlapping samples of inflation and stamp, we obtain a substantial fit for this model. For the years where data are missing, we impute the data using the obtained (and 5% significant) parameter estimates.

There are various advantages of this method. First, it is very simple. Second, it relies on a single product, postage stamps, which are in use for a long time and always for the same purposes. Indeed, reconstructing inflation rates by looking at prices of the constituent products would be a cumbersome if not impossible task. Third, if we were to use the commonly applied imputation techniques like replacement by the average value, which is computed for the available data, then the newly constructed data have autocorrelation properties that are caused by this imputation technique and likely were not present in the underlying data. Fourth, replacing missing values by imputing numbers using data from other countries would bias the cross-correlations between those countries and predictability.

Naturally, the imputed values are only estimates, and we have no certainty about their realism. Hence, we have to judge the quality of the estimates based on face value.

Tables with the constructed data for 1960 to and including 2015 are given in Table A3 in the Data Appendix. For the Republic of Congo there were missing data within the sample for 1997 and 1998, and we estimate these as 10.5 and 0.9, which given the data around these numbers seem quite reasonable. For Lesotho, such missing data concerned 1997-1999, and with our method, we estimate these as 15.1, 12.4 and 14.7, respectively, which seem to have face value too. For Rwanda, the intermediate missing data concern 1994 and 1995, where we estimate the inflation figures for these years at 17.0 and 9.8, which also seem reasonable. Finally, for Zimbabwe for the years 2008 and 2009, we obtain 160 and 1419762, respectively. Here we seem to have an estimate that may not be very accurate, that is 160 for 2008, at least considering the estimates of Hanke and Kwok (2009). The reason is that we have no data for postage stamps in 2008. However, to stick to one overall simple method, we keep the estimate 160 for now, and later on we will see that in much of the analysis the country of Zimbabwe has to be discarded anyway, due to the outrageous hyperinflation period.

Figures A1 to A5 visualise all the data, where we decided to partition Africa into five regions, to be called North Africa (5 countries), West Africa (14), Central Africa (8), East Africa (11) and South Africa (9), in total incorporating 47 countries. A first sight, the graphs in each of these Figures do not show obvious resemblance. Sometimes peak years seem to coincide, in particular for West African countries (more on the peaks in the next section). Three countries display obvious periods of hyperinflation, that is, Angola, the Democratic Republic of Congo (formerly called Zaire) and again Zimbabwe.

Another feature of the graphs in Figure A1 to A5 is that the imputed data seem to have face value across all series. The (imputed) peak value in 1978 in Tunisia seems perhaps a bit odd, but in the next section, we will learn that there is a sound reason for this high inflation value. For Guinea Bissau in Figure A2 the first set of observations do not seem very informative, nor are the first ten or so for Benin. The same holds for the last observations for Somalia in Figure A4, and most data points for Namibia in Figure A5. For almost all other countries, however, the data seem to follow reasonable patterns.

In Figure A6, we depict the inflation data for 44 countries into a single graph, thereby excluding the three hyperinflation countries. It is our first impression that these series do not seem to have much in common, and one may wonder whether an average inflation rate would be a meaningful number, given such obvious heterogeneity. Just as an indication, if we

consider the inflation rates for Japan, France and the USA as they are presented in Figure 2, then these series seem to have much more in common than those in Figure A6.

Properties of country-specific data

We first look at the properties of inflation data over the years 1960 to 2015. Table 1 provides the mean, median, minimum and maximum values, as well as the year with peak inflation. There are three obvious cases with hyperinflation periods, and these are Angola with 4145 in 1996, the Democratic Republic of Congo with 23773 in 1994, and Zimbabwe with (postage stamps based) 1419762 in 2009. In much of our further analysis, we will have to discard these countries.

The mean of the mean inflation is 581.6 with the inclusion of the three hyperinflation countries, and it is 11.569 without these three countries. The median is usually below the mean, which implies that the data are skewed to the right, meaning that there are exceptionally high maximum values. For example, maximum inflation rates can be as large as 75.3 for Chad in 1960, 122.9 for Ghana in 1983, 121.0 for Malawi in 1970, and 178.7 for Sierra Leone in 1987.

In Table 2, we report on potential explanations for the peak levels of inflation, and in the footnotes to each of the panels, we present our sources. Table 2a displays the potential explanations for the five countries in North Africa. The 1978 peak in inflation in Tunisia is based on our postage stamps based imputation method, and it seems to associate indeed with falling prices of the key export product and strikes and social unrest. Table 2b, concerning West Africa, shows that the devaluation of the African Financial Community (CFA) Franc in 1994 caused high inflation rates in Benin, Mali, Niger, Senegal and Togo. For Gambia and Sierra Leone the devaluation of the own currency in 1983 and 1987, respectively, associates with peak inflation. For Ivory Coast in 1977 and Nigeria in 1995, inflation peaked due to poor economic policy, mainly pressing central banks to cover the fiscal deficit of the government. Table 2c concerns the eight countries in Central Africa, where again the devaluation of the CFA Franc hit Equatorial Guinea and Gabon in 1994, where for the Democratic Republic of Congo all mishap (like fiscal deficit problems) occurred in that very same year. Angola with hyperinflation in 1996 is a special case as in that year also the entire government was dismissed. Table 2d presents the potential explanations of peak inflation for

countries in East Africa, and there we see a range of causes, from devaluations of currency to poor economic policy to effects of a worldwide economic crisis. Finally, Table 2e considers countries in South Africa, and there of course the case of Zimbabwe is noticeable. Complete mismanagement of the country, in various dimensions, resulted in the now almost classic case of hyperinflation. For the other countries similar explanations as before hold, where Lesotho provides a typical case of heavy reliance on a single type export product, which provides problems if tariffs are increased.

Table 3 presents further data properties across the annual data, and these concern the standard deviation, the skewness and kurtosis. In the case that the data follows a normal distribution, skewness would be 0, and evidently, most estimates of skewness are far from that value. Hyperinflation countries show large skewness values, of course, but the estimates are also high for Chad, Gambia, Mauritius, Somalia and Tunisia. The same holds for kurtosis, which is quite substantial for Gambia, Mail, Somalia and Tunisia. The standard deviation is large, next to the well-known three countries, for example for Ghana, Guinea Bissau, Malawi, Sudan and Zambia. This already seems to suggest that there is quite some variation in the data properties across countries. Below we will correlate these numbers in Tables 1 and 3 with properties of the countries in terms of economy, politics and fractionalization.

The final set of country-specific properties concern time series features. Table 4 reports the first order autocorrelation estimated for each of the 47 countries. Three of these are negative (for Chad, Mauritania and Zimbabwe), but mot autocorrelations are positive and within a range of 0.2 to 0.8. Interestingly, this range is often found for inflation data. At the same time, various studies suggest that inflation data show signs of long memory, meaning that shocks last for a long while but are not permanent. Bos et al. (1999) and Hyung and Franses (2005) show that typically inflation rates can experience occasional level shifts, and data with such shifts can also be described by a model like

$$(1-L)^d y_t = \mu + \varepsilon_t \qquad \text{with } 0 < d < 1$$

where L is the familiar lag operator. When $d = 1$, one transforms the data into growth rates, where when $d = 0$, the data have only short memory. The fractional differencing operator $(1-L)^d$ is defined by the binomial expansion

$$(1-L)^d = 1 - dL - \frac{d(1-d)L^2}{2!} - \frac{d(1-d)(2-d)L^3}{3!} - \cdots$$
$$- \frac{d(1-d)(2-d)..(j-1-1-d)L^j}{j!} - \cdots$$

There are various ways to estimate the parameter *d*, but for convenience we rely on a very simple one, which is based on estimating an autoregression of order *p* like

$$y_t = \mu + \phi_1 y_{t-1} + \phi_2 y_{t-2} + \cdots + \phi_p y_{t-p} + \varepsilon_t$$

while imposing the parameter restrictions

$$\phi_1 = d$$
$$\phi_2 = \frac{d(1-d)L^2}{2!}$$
$$\phi_3 = \frac{d(1-d)(2-d)L^3}{3!}$$

and so on. Nonlinear least squares gives an estimate of *d* and its associated estimated standard error.

The right-had side panel of Table 4 gives the estimates for the cases where *p* is set equal to 5. For 10 out of 47 countries, the fractional differencing parameter is estimated to be larger than 0.5, suggesting non-stationarity of the inflation data. Incorporating the estimated standard errors, the parameter is 5% significantly different from 0.5 only for Algeria, South Africa and Uganda.

Based on the reported properties in Tables 1 to 4, the first impression that we obtain is that there is a wide variation in these properties across the countries. Years with peak inflation vary substantially across the decades, as do the potential explanations for these inflation peaks. Mean, median, and other statistical properties like skewness and kurtosis, show strong signs of variation as well. There also do not seem to be clusters of countries with obvious similar properties, except perhaps the three countries with hyperinflation. This will be examined in the next section. The time series properties also differ substantially, meaning that the future inflation rates are more or less predictable using the own past. Finally, persistence of shocks also shows variation.

Properties across of countries

We now turn to an examination whether there are any correlations and relations between inflation rates across countries. Figure A.6 suggested that patterns in the data across the 47 countries vary widely, but perhaps other techniques reveal links that are not immediately observable.

Figure 3 provides the correlations across neighbouring countries, where the graphs again concern the five regions analysed earlier. Figure 3a shows that the contemporaneous correlations across the five countries in the North African region are quite small, with a maximum value of 0.42 of Egypt with Sudan. Figure 3b shows that such correlations can go up to 0.66, here for Benin and Togo, and 0.69 of Togo with Burkina Faso, whereas otherwise the correlations are quite small. Similar conclusions can be drawn from Figure 3c for the countries in Central Africa, except for the 0.70 of Gabon with Cameroon. The correlations between the inflation data in the East Africa region in Figure 3d are small, and something similar holds for the countries in South Africa in Figure 3e. In sum, there is little contemporaneous correlation across neighbouring countries.

Figure 4a presents a histogram of all the ½(47 times 46) is 1081 correlations across all the countries. The maximum value is 0.813, minimum value is -0.435, but most importantly, the mean value is 0.180 and the median value is 0.158. When we fit a mixture of two normal distributions to the data, we obtain the distributions as in Figure 4b, and these represent a distribution with mean around 0, and one with a mean around 0.4. In any case, the overall impression is that the contemporaneous correlations are small.

To show some specific correlations, we report the contemporaneous correlations between each country and South Africa (in money terms the largest economy of the continent), France (representing Europe), Japan (for Asia) and the United States of America as the leading economy in the world. All correlations are computed for the full sample 1960 to 2015, thereby again showing the benefit of having a complete dataset. The numbers in the first column of Table 5 show that the largest correlations with the South African data are obtained for Egypt, Gambia, Morocco, Sierra Leone, Swaziland, Tanzania and Uganda, which obviously are not all countries geographically near to South Africa. The largest correlation coefficient is equal to 0.765. The next column of Table 5 shows that Botswana, Ghana, Mauritania and in particular Morocco have large correlations with France. Correlations with Japan are all quite small, except for the Republic of Congo and Morocco.

Finally, the correlations with the USA are also often very small, except for Botswana, Ivory Coast, Mauritius and again Morocco. Taking all this together suggests that only Morocco seems to follow worldwide fluctuations in inflation.

Zooming in on the potential links between country-specific inflation and USA inflation, consider the p-values of the tests for Granger causality, based on a vector autoregression of order 1, as they are summarized in Table 6. We find evidence of Granger causality from the USA to an African country for 11 of the 47 countries, to wit, Botswana, Burkina Faso, Gabon, Ghana, Lesotho, Mauritius, Morocco, Niger, Senegal, South Africa and Togo. This means that if one were to construct country-specific models for these African countries, these models should include one-period-lagged USA inflation, while for the other countries there seems no need to do so. The next column of Table 6 shows that there is just one single case where Granger causality runs the other way around, and this is for Tunisia. Most likely, this is a statistical artefact, as with a significance level of 5% one should find significance in 5% of the 47 cases, which is 2 cases.

Table 7 reports on the outcomes of estimating a vector autoregression of order 1 for the countries in each of the 5 regions. More specifically, it reports on the fraction of significant parameters in the off-diagonal areas of the parameter matrix. The number of off-diagonal parameters is k time k-1, where k is the number of countries. The fraction of 5% significant parameters ranges from around 9% to 20%, which is a fairly small number.

This is also reflected by the associated impulse response functions as they are presented in Figures 5a to 5e. Consider for example the graphs in Figure 5a for the five countries in North Africa. Shocks from Egypt have a temporary effect on the inflation in Algeria (see left upper panel), whereas shocks from Morocco have some effect on inflation in Egypt. Otherwise, these five countries do not seem to have an impact on each other's future pattern of inflation. The impulse response functions in Figure 5b give the overall visual impression that most graphs show close to horizontal lines. Hence, past inflation in West-African countries does not seem to predict future inflation in other countries within that same region. The impulse response functions in the other three African regions, in Figures 5c, 5d and 5e, show similar patterns. There is hardly any merit in including past data from other African countries in single country models.

Finally, we turn to Principal Components Analysis (PCA). When we apply PCA to the data for France, Japan and USA we obtain for the raw data the eigenvalues 2.425, 0.446 and 0.129, and for the residuals after fitting country-specific autoregressive models of order 1, the eigenvalues 2.359, 0.418 and 0.223. Hence, in both situations there clearly is a single

dominant principal component, with 0.808 and 0.786 percent of the variation explained, respectively. The weights in the first principal components are 0.610, 0.535 and 0.584 for the raw data, and 0.600, 0.553 and 0.578 for the, so-called pre-whitened data. These weights are clearly very similar. Note that we look at the pre-whitened data in order to check for potential spurious principal components.

If we run a Principal Components Analysis for 44 countries, that is, all countries without Angola, Democratic Republic of Congo and Zimbabwe, then we obtain a first eigenvalue of 10.827 associated with 24.6% of the total variance. The first 11 eigenvalues are all above 1, and these first 11 eigenvalues are associated with 0.787 of the total variance.

This analysis suggests that it might be better to run PCA for smaller sets of countries, and hence we again resort to the five regions. Table 8 reports on the estimated eigenvalues and the percentages of variance explained for each of the estimated principal components. Comparing the results across the top and bottom panel, involving the original data and the pre-whitened data, respectively, we see that for four of the five regions (not Central Africa), pre-whitening leads to a less prominent first principal component, and in general a tendency to shrink towards a mean value of 1. That mean value of 1 implies that there are no relevant principal components. When we look at the results in the bottom panel more closely, we see that there are 2, 5, 2, 5 and 3 eigenvalues larger than 1, respectively, that is, 17 out of the 44 eigenvalues. This suggests that PCA does not lead to obvious summaries of the data, again suggesting that variation across the countries is substantial.

Cross-sectional analysis

So far, we looked at the data over time, also to see if there is any predictability across series and perhaps relative to other than African countries. In this section, we will summarize the data over the time dimension, and see if there are any properties of inflation that associate with more time-invariant properties of the countries. A summary over the countries of the features reported in Tables 3 and 4 is presented in Table 9.

There is literature on the relation between inflation and country-specific features. Bleaney and Francisco (2016) document that “inflation is highly persistent and is higher in countries that are less politically stable.” This would suggest that the estimated autoregressive parameter and the fractional differencing parameter in Table 4 are related to variables like the

degree of democracy. We use as our source for the operationalization of a variable "Democracy" the democracy index created by the Economist Intelligence Unit. It is a weighted average of 60 questions. https://en.m.wikiperia.org/wiki/Democracy_Index presents some details. The data for 2016 are retrieved from that site on August 22 2017 and they concern 2016. A higher score means that there is more democracy. Scores on this variable are presented in the third column of Table 10. Aisen and Vega (2006) also discuss a link between political instability and inflation.

Lopes de Veiga et al. (2016) report that "high levels of public debt are coincident with reduced rates of economic growth and rising levels of inflation". Higher levels of public debt can be associated with inappropriate tax collection methods, which in turn can be caused by corruption. As a source of corruption, we rely on the Corruptions Perceptions Index from Transparency International, and details of how the data are compiled can be found at https://en.m.wikipedia.org/wiki/Corruption_Perceptions_Index. A higher score means less corruption. The data are retrieved on August 22 2017 and concern 2016. The relevant data are displayed in the second column of Table 10. Barugahara (2015) reports that political instability associates with more inflation volatility. She uses the estimated conditional volatility from a GARCH(1,1) model. We tried to estimate this model for our annual data, but for many countries this estimation procedure failed. Hence, we will use simply the standard deviation.

It might perhaps be the case that more diversity in economic activity, and hence less dependence on a single export product, associates with less inflation, see Durevall et al. (2013). We could not obtain a measure for economic diversity, and decide to approximate this variable using the degree of urbanization. The data on urbanization are taken from the CIA World Factbook and concern 2015. The data are made available through https://en.m.wikipedia.org/wiki/Urbanization_by_country. A higher score means more urbanization, and the relevant data appear in the last column of Table 10. We would expect that more urbanization is associated with a larger industry and service sector, and a smaller agricultural sector. More urbanization would then associate with less inflation.

The final three variables that we consider deal with so-called fractionalization. Alesina and La Ferrara (2005) discuss the potential economic consequences of diversity, and these can be positive or negative. Conflicts might originate from ethnic and religious differences. Data on ethnic and cultural diversity are retrieved from Alesina et al. (2003). There are three categories, and these are ethnic fractionalization, linguistic fractionalization and religious fractionalization. A higher score means more diversity in ethnic groups,

languages and or religions. One could hypothesize that less fractionalization could lead to more stability, and hence more fractions lead to more frictions and hence higher levels of inflation. The relevant data appear in the fourth, fifth and sixth column of Table 10.

The results of the regression analyses with Corruption, Democracy, Ethnic Fractionalization, Languages Fractionalization, Religious Fractionalization, and Urbanization as explanatory variables are presented in Tables 11a and 11b. Table 11a reports on three variables to be explained, that is, mean inflation, median inflation and the standard deviation of inflation. The results on the mean and median inflation are quite clear. We see that less corruption, more democracy, and less religious fractionalization corresponds with lower inflation rates. For the standard deviation, we see that countries with more corruption and less urbanization generally have higher volatility in the inflation rates. Hence, these results seem to corroborate the findings that are already available in the literature. The results in Table 11b on the first order autoregressive parameters and the fractional differencing parameters can be summarized as that there is no explanatory power in the independent variables at all.

Conclusion and discussion

This paper looked at the properties of data on annual inflation in 47 African countries. Prior to this analysis, we created a fully balanced panel data set, comprising the years 1960 to and including 2015. To create this complete dataset, we resorted to a new and rather unorthodox method, which used the prices of postage stamps to predict the missing inflation rates. For almost all countries, we could impute estimated annual inflation figures, resulting in estimated data almost always with face value, except for a few countries, where, due to data limitations on the side of postage stamps, we could not deliver very reliable estimates. In a next step, we compared various properties of the annual data, like the mean and median, but also long memory properties like persistence across the countries. Furthermore, we looked at Granger causality, predictability, and principal components.

The key conclusion of our study is that there are so many differences across the data for the various countries that it is not justified by the properties of the data to generalize these countries by studying something like “average inflation in Africa” or even “panel models for Sub-Saharan countries”. Our results show that diversity amongst the data features is huge, and hence our main conclusion is that models for inflation for African countries should be

constructed for one country after the other. The data have more differences than common features, and this seems to be a stylized fact, whichever feature of the data is considered. So, we recommend modellers to build forecasting and explanatory models for each country separately, and not to assume that there are substantial common features that warrant pulling each of the countries through a single model.

Is there really nothing common across the African countries? Yes, there is. Looking at time-independent features of inflation, like the mean and media over the years, and correlating these with more persistent features of the countries, like measures of democracy and urbanization, we learn that high inflation levels associate with less democracy, more corruption and a higher level of religious fractionalization. These findings corroborate with earlier findings in the relevant literature.

Finally, a key by-product of our study is a complete dataset on inflation for 56 years for 47 African countries, and we hope that this dataset encourages more research on the causes and consequences of inflation in Africa.

Data Appendix

In this appendix, we show how we created estimates for the missing inflation data. We use the prices reported on the postage stamps. Countries issue postage stamps, and usually there are several issued stamps per year. For example, the number of issued postage stamps can be as large as 666 in one year (Gambia, 2000), but usually fall in the range of 10-60 postage stamps per year. We take the median of all prices available for each year, and with these median prices we compute the percentage changes, and these are then associated with the inflation data.

In Table A1, we indicate for each country for which years, official inflation rates are available (at the time of analysis, that is, May 2017). In the right hand panel, we give the availability of postage stamp percentage price changes. For the official inflation rates, we use inflation rates (consumer prices, annual %) as obtained from World Bank, unless indicated otherwise.

The source of the postage stamps prices in Stanley Gibbons, Africa, Simplified Catalogue, 1st Edition, 2011, Published in Great Britain by Stanley Gibbons Ltd. Manual coding of all the stamps data took about two months, full time.

A postage stamp "inflation rate" is considered available for a country when multiple postage stamp prices are available for two consecutive years, such that the increase between the average postage price of two years can be computed, which is interpreted as the "postage stamp inflation rate". For two African countries, we have not enough information on the stamps. Postage stamp series for Eritrea are available as far back as 1922, however, only up until 2004, whereas World Bank inflation rates are only reported since 2010. Liberia has postage stamp series dating back to 1944, but ending at 1993. This means there is no overlap with the World Bank inflation rates that start in 2002.

Table A1 clearly shows what valuable information these postal stamps have to add. Consider for example Mali. Mali only has available inflation data since 1989, but we have an uninterrupted series of postal stamp data between 1960 and 2003. Table A1 shows that for the Republic of Congo, Lesotho, Rwanda and Zimbabwe, there are missing data within the sample period. For some countries data are missing at the end of the sample (like Central African Republic), but for most countries data are missing at the start of the sample.

Table A1. Availability of data on inflation rates and postal stamp prices (1960-2015)

Country	Availability of inflation %	Availability of postal stamp %
Algeria	1970-2015	1963-2010
Angola	1991-2015	1960-1972, 1975-1977, 1980-2010
Benin	1993-2015	1977-1999
Botswana	1975-2015	1964-2009
Burkina Faso	1960-2015	1961-1996
Burundi	1966-2015	1963-1977, 1980-1984, 1987-1996, 1999-2000
Cameroon	1969-2015	1960-2002
Cape Verde	1984-2015	1962-1973, 1976-2005
Central African Republic	1982-2013	1960-1976, 1980-1994
Chad	1984-2014	1960-1992, 1998, 2005
Republic of Congo	1986-1996, 1999-2015	1960-1996, 1999, 2006
Dem. Republic of Congo	1964-2013	1961-1985, 1988, 1991-1994, 1999-2002
Egypt	1960-2015	1960-2010
Equatorial Guinea	1986-2014	1971-1972, 1980-2001
Ethiopia	1966-2015	1960-2010
Gabon	1963-2015	1964-2010
Gambia	1962-2014	1964-2010
Ghana	1965-2015	1960-2010
Guinea Bissau	1988-2015	1975-1995, 2002
Ivory Coast	1961-2015	1960-2003
Kenya	1960-2015	1964, 1976-1998, 2001-2010
Lesotho	1974-1996, 2000-2015	1966-2002, 2005-2008
Libya	1965-2014	1960-2009
Madagascar	1965-2015	1960-1997, 2000-2008
Malawi	1981-2015	1965-2000, 2003-2005, 2009
Mali	1989-2015	1960-2003
Mauritania	1986-2014	1963-1991, 1994-1996
Mauritius	1964-2015	1966-2010
Morocco	1960-2015	1960-2009
Mozambique	1988-2015	1961-1969, 1972-2002
Namibia	2003-2015	1964-1968, 1971-2009
Niger	1964-2015	1960-1995, 1998-2002
Nigeria	1960-2015	1960-2008
Rwanda	1967-1993, 1996-2015	1963-1993
Senegal	1968-2015	1961-1999, 2002-2009
Seychelles	1971-2015	1963, 1966-2009
Sierra Leone	1960-2015	1965-1972, 1978-2010
Somalia (GDP deflator)	1961-1990	1960-1989
South Africa	1960-2015	1962-2010
Sudan	1960-2015	1959-1970, 1973-1981, 1984-1987, 1990-2009
Swaziland	1966-2014	1962-2008
Tanzania	1966-2015	1964-1967, 1976-2009
Togo	1967-2015	1960-1992, 1995
Tunisia	1984-2015	1960-2008
Uganda	1981-2015	1976-2010
Zambia	1986-2015	1965-2010
Zimbabwe	1965-2007, 2010-2015	1966-1978, 1981-2008

The first step in the process of imputing missing inflation data, after constructing an index for the postage stamps prices and computing percentage changes, is to perform a regression of the actual inflation data on the percentage price changes of the postage stamps. The number of observations in each model of course depends on the timeframe where the two series overlap. For this regression, we include both lagged actual inflation data and current and lagged postage stamp inflation data. The exact model specification varies per country and is determined by looking at model fit, information criteria and statistical tests on residual autocorrelation. The model specification for each country is given in Table A2.

To get an idea of the fit of these models described in Table A2, we discuss a selection of the countries. The regression for Algeria in the end uses 40 observations. The R^2 is 0.738 and the adjusted R^2 is 0.708. All estimated parameters are significant at a 5% level except for the constant (p-value of 0.057). For Egypt, with 51 observations after adjustments, we find that STAMP(-2) has a p-value of 0.044 and the regression has an R^2 of 0.568 (adjusted R^2 0.541). Morocco, with 50 observations, has an R^2 of 0.452 and a p-value of 0.044 for STAMP(-1). Nigeria, 49 observations, has an R^2 of 0.551 and STAMP(-2) has a p-value of 0.0003. Other regressions with a good fit are (R^2 between brackets): Zimbabwe (0.614), Zambia (0.669), Uganda (0.696), Democratic Republic of Congo (0.531), Tunisia (0.674), Tanzania (0.74), Sudan (0.71), South Africa (0.797), Sierra Leone (0.594), Mozambique (0.622), Mali (0.474), Kenya (0.427), Ghana (0.406), Gabon (0.499), Equatorial Guinea (0.563), Chad (0.426), Cameroun (0.588, data after 1988), Central African Republic (0.599). Of course, there are also countries with a poorer fit, such as Republic of Congo (0.065), Ethiopia (0.098), Namibia (0.154), and Senegal (0.177). For the countries that are not mentioned, the R^2 values are between 0.2-0.4.

The next step of our method is the following. In order to impute the missing inflation data, we make use of the parameter estimates in Table A2. Furthermore, we actually also have to make some assumptions about the missing postage stamp data and the initial inflation rates. That is, we make forecasts for the inflation rates (which are actually so-called back-casts) by assuming that in 1958 and 1959, the inflation rates were equal to their total sample median value. Furthermore, if there is no data on postage stamp prices, it is assumed that this is because the postage stamp prices have not changed that year and that the old ones were still in use. Therefore, the postage stamp inflation is set at 0 for missing observations. Using this procedure, for each country, the following equation is used recursively, that is,

$$\text{inflation}_t = \alpha + \beta_1 \text{inflation}_{t-1} + \beta_2 \text{inflation}_{t-2} + \gamma_1 \text{stamp}_t + \gamma_2 \text{stamp}_{t-1} + \gamma_3 \text{stamp}_{t-2} + \gamma_4 \text{stamp}_{t-3}$$

to obtain estimates for the inflation rates for the period 1960-2015.

The last step in the procedure is to combine the data from World Bank and the data as obtained from the back-casting method described above. When inflation data from the World Bank is available, this data is used. When data is missing, the back-casted inflation data from our method is imputed. This results in the data as reported in Table A3.

Table A2. 10% significant Parameter estimates per country (STAMP refers to percentage change in postage stamp prices compared to the previous year and INFL to the inflation rates obtained from World Bank.

Country	C	INFL (-1)	INFL (-2)	STAMP	STAMP (-1)	STAMP (-2)	STAMP (-3)
Algeria	2.2134	0.952	-0.347		0.069	0.048	
Angola	93.118	0.512			0.483		
Benin	7.977			0.101			
Botswana	5.080	0.490			0.002		
Burkina Faso	2.961	0.204			0.057	0.010	
Burundi	2.784	0.685			0.012	0.004	
Cameroun (after 1988)	0.460	0.265		0.008			
Cape Verde	2.278	0.378			0.034		
Central African Republic	0.064	0.560				0.073	
Chad	0.871			0.114			
Republic of Congo (till 1978)	3.588			0.000			
Dem. Republic of Congo	19.651			0.067		0.068	
Egypt	2.182	0.501	0.242			0.027	
Equitorial Guinea	1.410	0.446		0.004			
Ethiopia	5.818	0.222			0.084	0.060	
Gabon	1.263	0.573		0.070	0.063		
Gambia	3.070	0.532		0.025	0.027		
Ghana	12.843	0.543	-0.198			0.016	
Guinea-Bissau	42.340					0.014	
Ivoorkust	1.999	0.536			0.020		
Kenya	7.884	0.536	-0.315	0.092	0.077		
Lesotho	12.315	-0.069		0.052			
Libya	2.109	0.549		0.0002			
Madagascar	5.603	0.405			0.019		
Malawi	15.056	0.351		0.037		0.017	
Mali	2.295	0.265		0.003	0.000	0.017	
Mauritania	6.804					0.021	
Mauritius	2.434	0.446		0.063		0.102	
Morocco	1.600	0.619			0.004		
Mozambique	2.846	0.774					0.019
Namibia	3.199	0.409					
Niger	2.831	0.334		0.115			
Nigeria	4.919	0.636					
Rwanda	3.387	0.577					
Senegal	3.310	0.289			0.068		
Seychelles	2.652	0.587					0.013
Sierra Leone	3.824	0.233		0.225	0.261		
Somalia	7.866	0.499		0.084			
South Africa	1.177	0.873			0.001		
Sudan	1.664	0.640		0.088	0.123		
Swaziland	5.235	0.456		0.000	0.022		
Tanzania	2.723	0.789		0.039			
Togo	2.888	0.450			0.013		
Tunisia	1.078	0.701			0.019		
Uganda	6.038	1.052	-0.312			0.061	
Zambia	11.645	0.504		0.175			
Zimbabwe	2.860	0.764			0.035		

Table A3: Italic and boldface data are newly constructed data

	ALGERIA	ANGOLA	BENIN	BOTSWANA	BURKINA FASO	BURUNDI	CAMEROON
1960	***2.7***	***215.1***	***8.0***	***9.6***	7.8	***8.2***	***11.1***
1961	***2.6***	***180.5***	***8.0***	***9.8***	18.6	***8.4***	***10.9***
1962	***3.8***	***290.7***	***8.0***	***9.9***	1.7	***8.6***	***11.4***
1963	***4.9***	***254.3***	***8.0***	***9.9***	5.6	***8.6***	***10.5***
1964	***4.6***	***208.9***	***8.0***	***9.9***	1.8	***9.0***	***12.4***
1965	***-0.4***	***164.0***	***8.0***	***10.0***	-0.7	***9.2***	***9.9***
1966	***12.5***	***265.7***	***8.0***	***9.93***	2.4	4.4	***15.0***
1967	***22.7***	***215.1***	***8.0***	***10.3***	-4.3	-1.1	***11.5***
1968	***18.8***	***205.6***	***8.0***	***10.1***	-0.3	6.1	***10.4***
1969	***10.8***	***168.3***	***8.0***	***9.9***	9.7	4.0	-1.1
1970	6.6	***201.3***	***8.0***	***10.***	1.8	-0.2	5.9
1971	2.6	***229.0***	***8.0***	***10.***	2.1	3.9	4.0
1972	3.7	***198.2***	***8.0***	***9.9***	-2.9	3.8	8.1
1973	6.2	***162.5***	***8.0***	***9.9***	7.6	6.0	10.4
1974	4.7	***176.4***	***8.0***	***9.9***	8.7	15.7	17.2
1975	8.2	***183.5***	***8.0***	12.	18.8	15.7	13.6
1976	9.4	***146.9***	***8.0***	11.7	-8.4	6.9	9.9
1977	12.0	***308.5***	***11.7***	13.2	30.	6.8	14.7
1978	17.5	***213.6***	***8.5***	9.0	8.3	23.9	12.5
1979	11.3	***202.6***	***0.9***	11.7	15.	36.5	6.6
1980	9.5	***196.9***	***16.1***	13.6	12.2	2.5	9.6
1981	14.7	***491.0***	***17.0***	16.4	7.6	12.2	10.7
1982	6.5	***302.7***	***5.8***	11.1	12.1	5.9	13.3
1983	6.0	***869.6***	***4.7***	10.5	8.2	8.2	16.6
1984	8.1	***516.3***	***6.9***	8.6	4.8	14.3	11.4
1985	10.5	***369.0***	***14.3***	8.1	6.9	3.8	8.5
1986	12.4	***283.2***	***11.7***	10.0	-2.6	1.7	7.8
1987	7.4	***215.1***	***4.7***	9.8	-2.7	7.1	13.1
1988	5.9	***210.3***	***9.9***	8.4	4.3	4.5	1.7
1989	9.3	***188.0***	***7.0***	11.6	-0.5	11.7	-1.7
1990	16.7	***201.3***	***10.8***	11.4	-0.5	7.0	1.1
1991	25.9	83.6	***15.6***	11.8	2.2	9.0	0.1
1992	31.7	299.1	***16.0***	16.2	-2.0	1.8	0.0
1993	20.5	1379.4	0.4	14.3	0.6	9.7	-3.2
1994	29.0	948.8	38.5	10.5	25.2	14.9	35.1
1995	29.8	2671.8	14.5	10.5	7.5	19.3	9.1
1996	18.7	4145.1	4.9	10.1	6.1	26.4	3.9
1997	5.7	219.2	3.5	8.7	2.3	31.1	4.8
1998	5.0	107.3	5.8	6.7	5.1	12.5	3.2
1999	2.6	248.2	0.3	7.7	-1.1	3.4	1.9
2000	0.3	325.	4.2	8.6	-0.3	24.3	1.2
2001	4.2	152.6	4.0	6.6	5.0	9.2	4.4
2002	1.4	108.9	2.5	8.0	2.2	-1.4	2.8
2003	4.3	98.2	1.5	9.2	2.0	10.8	0.6
2004	4.0	43.5	0.9	6.9	-0.4	7.9	0.2
2005	1.4	23.0	5.4	8.6	6.4	13.5	2.0
2006	2.3	13.3	3.8	11.6	2.3	2.8	5.1
2007	3.7	12.2	1.3	7.1	-0.2	8.3	0.9
2008	4.9	12.5	7.9	12.7	10.7	24.1	5.3
2009	5.7	13.7	2.2	8.0	2.6	11.	3.0
2010	3.9	14.5	2.3	6.9	-0.8	6.4	1.3
2011	4.5	13.5	2.7	8.5	2.8	9.7	2.9
2012	8.9	10.3	6.8	7.5	3.8	18.0	2.9
2013	3.3	8.8	1.0	5.9	0.5	8.0	1.9
2014	2.9	7.3	-1.1	4.4	-0.3	4.4	1.9
2015	4.8	10.3	0.3	3.1	1.0	5.6	2.7

	CAPEVERDE	CAR	CHAD	REPUBLIC of CONGO	DR of CONGO (ZAIRE)	EGYPT	EQ GUINEA
1960	***3.9***	***1.3***	***75.3***	***4.4***	***30.3***	0.3	***3.4***
1961	***3.7***	***0.8***	***-5.2***	***32.9***	***29.5***	0.7	***2.9***
1962	***3.7***	***28.7***	***-3.7***	***58.2***	***25.4***	-3.0	***2.7***
1963	***2.5***	***11.4***	***5.7***	***11.1***	***32.7***	0.7	***2.6***
1964	***2.2***	***9.3***	***-1.4***	***6.9***	35.4	3.7	***2.6***
1965	***1.8***	***3.8***	***0.2***	***14.7***	-2.7	14.8	***2.6***
1966	***7.1***	***7.6***	***10.***	***4.5***	15.8	9.0	***2.6***
1967	***2.6***	***2.7***	***-4.5***	***5.2***	36.9	0.7	***2.5***
1968	***3.8***	***0.9***	***3.4***	***12.3***	53.3	-1.7	***2.5***
1969	***15.***	***2.9***	***0.9***	***15.1***	6.2	3.4	***1.4***
1970	***5.7***	***2.3***	***4.6***	***8.6***	8.0	3.8	***1.5***
1971	***6.0***	***1.6***	***6.1***	***15.9***	5.8	3.1	***1.1***
1972	***6.6***	***10.5***	***-3.5***	***7.3***	15.8	2.1	***0.6***
1973	***4.9***	***2.3***	***17.1***	***3.4***	15.6	5.1	***-1.0***
1974	***2.2***	***0.2***	***-2.5***	***37.4***	29.5	10.0	***0.6***
1975	***3.1***	***1.0***	***-2.2***	***93.6***	28.7	9.7	***4.3***
1976	***3.4***	***0.1***	***13.6***	***25.2***	80.4	10.3	***2.7***
1977	***7.0***	***-1.6***	***0.5***	***6.4***	68.9	12.7	***4.1***
1978	***3.7***	***15.3***	***1.3***	***20.5***	48.8	11.1	***2.9***
1979	***1.9***	***8.6***	***2.5***	***28.9***	101.1	9.9	***2.2***
1980	***3.3***	***4.9***	***-8.5***	***12.2***	46.6	20.8	***3.9***
1981	***11.1***	0.0	***4.7***	***6.3***	35.4	10.3	***4.6***
1982	***7.5***	13.3	***27.9***	***1.8***	36.7	14.8	***2.2***
1983	***4.4***	14.6	***0.3***	***5.4***	76.5	16.1	***2.0***
1984	11.2	2.5	20.3	***15.0***	52.2	17.0	***11.2***
1985	5.4	10.4	5.2	***6.3***	23.8	12.1	***4.4***
1986	10.9	2.2	-13.1	4.2	44.4	23.9	-17.6
1987	3.8	-7.0	-6.0	0.4	78.7	19.7	-13.2
1988	4.1	-4.0	15.5	1.0	71.1	17.7	2.5
1989	4.6	0.7	-3.7	-1.8	104.1	21.3	6.2
1990	10.7	0.0	-0.7	2.9	81.3	16.8	0.9
1991	9.6	-2.8	3.2	-1.7	2154.4	19.7	-3.4
1992	3.1	-1.0	-3.1	-3.9	4129.2	13.6	-4.3
1993	5.8	-2.9	-8.4	4.9	1986.9	12.1	5.5
1994	3.5	24.6	41.7	42.4	23773.1	8.2	31.8
1995	8.4	19.2	9.2	9.4	541.9	15.7	19.9
1996	6.0	3.7	11.3	10.0	492.4	7.2	4.5
1997	8.6	1.6	5.6	***10.5***	198.5	4.6	3.0
1998	4.4	-1.9	4.3	***0.9***	29.1	3.9	7.9
1999	4.4	-1.4	-8.0	4.1	284.9	3.1	0.4
2000	-2.5	3.2	3.8	-0.9	513.9	2.7	4.8
2001	3.3	3.8	12.4	0.1	359.9	2.3	8.8
2002	1.9	2.3	5.2	4.4	31.5	2.7	7.6
2003	1.2	4.1	-1.8	-0.6	12.9	4.5	7.3
2004	-1.9	-2.1	-5.4	2.4	4.0	11.3	4.2
2005	0.4	2.9	7.9	3.1	21.3	4.9	5.6
2006	5.4	6.7	8.0	6.5	13.1	7.6	4.4
2007	4.4	0.9	-9.0	2.7	16.9	9.3	2.8
2008	6.8	9.3	10.3	7.3	17.3	18.3	6.6
2009	1.0	3.5	10.	5.3	2.8	11.8	4.7
2010	2.1	1.5	-2.1	5.0	7.1	11.3	7.8
2011	4.5	1.3	-3.7	1.3	15.3	10.1	2.5
2012	2.5	5.8	14.	3.9	9.7	7.1	1.0
2013	1.5	1.5	0.1	6.0	1.6	9.4	1.2
2014	-0.2	***0.1***	1.7	0.1	***27.9***	10.1	***4.8***
2015	0.1	***0.1***	0.9	5.0	***27.9***	10.4	***10.1***

	ETHIOPIA	GABON	GAMBIA	GHANA	GUINEA BISSAU	IVORY COAST	KENYA
1960	***13.9***	***3.4***	***6.2***	***18.6***	***42.3***	***-4.0***	1.2
1961	***12.6***	***3.2***	***6.4***	***20.8***	***42.3***	11.6	2.5
1962	***11.4***	***3.1***	1.8	***19.9***	***42.3***	-1.3	3.1
1963	***6.3***	7.2	4.6	***20.0***	***42.3***	0.9	0.7
1964	***4.8***	3.3	-4.5	***19.0***	***42.3***	0.6	-0.1
1965	***6.8***	2.4	1.2	26.4	***42.3***	2.6	3.6
1966	-1.4	3.6	0.2	13.2	***42.3***	4.2	5.0
1967	0.8	2.0	1.4	-8.4	***42.3***	2.3	1.8
1968	0.2	2.3	4.2	7.9	***42.3***	5.4	0.4
1969	1.4	3.0	5.0	7.3	***42.3***	4.5	-0.2
1970	10.1	3.8	-2.0	3.0	***42.3***	8.2	2.2
1971	0.5	3.9	3.1	9.6	***42.3***	-0.4	3.8
1972	-6.1	3.5	8.7	10.1	***42.3***	0.3	5.8
1973	8.9	6.2	6.9	17.7	***42.3***	11.1	9.3
1974	8.6	12.1	9.2	18.1	***42.3***	17.4	17.8
1975	6.6	28.5	25.9	29.8	***42.3***	11.4	19.1
1976	28.5	20.2	17.	56.1	***42.3***	12.1	11.4
1977	16.7	13.9	12.4	116.5	***42.4***	27.4	14.8
1978	14.3	10.8	8.9	73.1	***45.9***	13.2	16.9
1979	16.	8.0	6.1	54.4	***42.8***	16.3	8.0
1980	4.5	12.3	6.8	50.1	***42.5***	14.7	13.9
1981	6.1	8.7	5.9	116.5	***41.8***	8.8	11.6
1982	5.9	16.7	10.9	22.3	***42.9***	7.6	20.7
1983	-0.7	10.7	10.6	122.9	***42.6***	5.6	11.4
1984	8.4	5.9	22.1	39.7	***42.3***	4.3	10.3
1985	19.1	7.4	18.3	10.3	***41.7***	1.9	13.0
1986	-9.8	6.3	56.6	24.6	***43.3***	9.7	2.5
1987	-2.4	-0.9	23.5	39.8	***42.9***	6.9	8.6
1988	7.1	-8.8	11.7	31.4	60.3	6.9	12.3
1989	7.8	6.7	8.3	25.2	80.8	1.0	13.8
1990	5.2	7.7	12.2	37.3	33.0	-0.8	17.8
1991	35.7	-11.7	8.6	18.	57.6	1.7	20.1
1992	10.5	-9.5	9.5	10.1	69.6	4.2	27.3
1993	3.5	0.5	6.5	25.	48.1	2.2	46.0
1994	7.6	36.1	1.7	24.9	15.2	26.1	28.8
1995	10.	9.6	7.0	59.5	45.4	14.3	1.6
1996	-8.5	0.7	1.1	46.6	50.7	2.5	8.9
1997	2.4	4.0	2.8	27.9	49.1	4.0	11.4
1998	0.9	1.4	1.1	14.6	8.0	4.6	6.7
1999	7.9	-1.9	3.8	12.4	-2.1	0.7	5.7
2000	0.7	0.5	0.8	25.2	8.6	2.5	10.
2001	-8.2	2.1	4.5	32.9	3.3	4.4	5.7
2002	1.7	0.0	8.6	14.8	3.3	3.1	2.0
2003	17.8	2.2	17.0	26.7	-3.5	3.3	9.8
2004	3.3	0.4	14.2	12.6	0.9	1.5	11.6
2005	12.9	3.7	4.8	15.1	3.3	3.9	10.3
2006	12.3	-1.4	2.1	10.9	2.0	2.5	14.5
2007	17.2	5.0	5.4	10.7	4.6	1.9	9.8
2008	44.4	5.3	4.4	16.5	10.5	6.3	26.2
2009	8.5	1.9	4.6	19.3	-1.7	1.0	9.2
2010	8.1	1.5	5.0	10.7	2.5	1.2	4.0
2011	33.2	1.3	4.8	8.7	5.0	4.9	14.0
2012	22.8	2.7	4.3	9.2	2.1	1.3	9.4
2013	8.1	0.5	5.7	11.6	1.2	2.6	5.7
2014	7.4	4.7	5.9	15.5	-1.5	0.5	6.9
2015	10.1	***3.0***	***6.5***	17.1	1.4	1.2	6.6

	LESOTHO	LIBYA	MADA-GASCAR	MALAWI	MALI	MAURI-TANIA	MAURITIUS
1960	***11.5***	***5.5***	***12.6***	***20.2***	***3.0***	***6.8***	***5.4***
1961	***11.5***	***5.1***	***12.4***	***22.1***	***3.0***	***6.8***	***4.8***
1962	***11.5***	***4.9***	***11.3***	***22.8***	***5.1***	***6.8***	***4.6***
1963	***11.5***	***4.8***	***9.2***	***23.1***	***3.0***	***6.8***	***4.5***
1964	***11.5***	***4.8***	***10.6***	***23.1***	***2.4***	***6.8***	1.9
1965	***11.5***	11.4	4.2	***21.1***	***3.6***	***8.3***	1.8
1966	***15.9***	12.2	3.2	***22.1***	***2.5***	***6.8***	2.5
1967	***15.3***	7.3	0.8	***21.8***	***5.4***	***5.9***	1.9
1968	***8.5***	0.4	1.0	***29.1***	***3.6***	***8.1***	7.0
1969	***11.9***	9.8	3.8	***22.8***	***4.2***	***6.9***	2.3
1970	***11.1***	-5.3	2.9	***121.***	***3.6***	***6.5***	1.5
1971	***15.8***	-3.1	5.4	***53.1***	***3.7***	***7.6***	0.3
1972	***9.2***	-0.3	5.6	***75.8***	***3.3***	***6.8***	5.4
1973	***12.3***	8.0	6.1	***40.8***	***3.3***	***6.2***	13.5
1974	13.4	7.5	22.1	***27.8***	***2.8***	***7.6***	29.1
1975	14.2	9.1	8.2	***54.8***	***3.6***	***4.8***	14.7
1976	11.4	5.5	5.0	***30.9***	***3.7***	***7.2***	13.
1977	16.7	6.3	3.1	***39.7***	***3.5***	***5.6***	9.2
1978	13.5	29.4	6.5	***27.5***	***3.4***	***8.4***	8.5
1979	16.	-6.0	14.1	***29.2***	***3.3***	***6.4***	14.5
1980	16.3	9.7	18.2	***24.3***	***2.8***	***8.1***	42.
1981	12.4	11.2	30.5	11.8	***3.1***	***6.1***	14.5
1982	12.1	10.3	31.8	9.8	***3.3***	***6.9***	11.4
1983	17.5	10.6	19.3	13.5	***3.9***	***6.7***	5.6
1984	11.	12.5	9.9	20.0	***3.3***	***7.1***	7.4
1985	13.3	9.1	10.6	10.5	***4.1***	***6.5***	6.7
1986	18.	3.3	14.5	14.0	***2.8***	7.4	1.6
1987	11.8	4.4	15.0	25.2	***3.1***	8.2	0.5
1988	11.5	6.1	26.9	33.9	***2.9***	1.3	9.2
1989	14.7	1.5	9.0	12.4	-0.1	12.9	12.7
1990	11.6	8.5	11.8	11.8	0.6	6.6	13.5
1991	17.7	11.9	8.6	12.6	1.8	5.6	7.0
1992	17.2	9.4	14.5	23.8	-6.2	10.1	4.6
1993	13.1	11.1	10.	22.8	-0.3	9.4	10.5
1994	8.2	5.1	38.9	34.6	23.2	4.1	7.3
1995	9.3	7.2	49.1	83.3	13.4	6.5	6.0
1996	9.3	4.0	19.8	37.6	6.8	4.7	6.6
1997	***15.1***	3.6	4.5	9.1	-0.4	4.6	6.8
1998	***12.4***	3.7	6.2	29.7	4.0	8.0	6.8
1999	***14.7***	2.6	9.9	44.8	-1.2	4.1	6.9
2000	6.1	-2.9	11.9	29.6	-0.7	3.3	4.2
2001	-9.6	-8.8	6.9	22.7	5.2	4.7	5.4
2002	33.8	-9.8	15.9	14.7	5.0	3.9	6.5
2003	6.6	-2.2	-1.2	9.6	-1.3	5.2	3.9
2004	5.0	-2.2	13.8	11.4	-3.1	10.4	4.7
2005	3.4	2.7	18.5	15.4	6.4	12.1	4.9
2006	6.1	1.5	10.8	14.	1.5	6.2	8.9
2007	8.0	6.3	10.3	8.0	1.4	7.3	8.8
2008	10.7	10.4	9.2	8.7	9.2	7.3	9.7
2009	7.4	2.5	9.0	8.4	2.5	2.2	2.5
2010	3.6	2.8	9.2	7.4	1.1	6.3	2.9
2011	5.0	15.5	9.5	7.6	2.9	5.6	6.5
2012	6.1	6.1	6.4	21.3	5.4	4.9	3.9
2013	4.9	2.6	5.8	27.3	-0.6	4.1	3.5
2014	5.3	***4.7***	6.1	24.4	0.9	3.5	3.2
2015	3.2	***4.7***	7.4	21.2	1.4	6.8	1.3

	MOROCCO	MOZAM-BIQUE	NAMIBIA	NIGER	NIGERIA	RWANDA	SENEGAL
1960	3.4	***13.5***	***5.4***	***3.6***	5.4	***7.0***	***4.0***
1961	1.8	***13.3***	***5.4***	***3.0***	6.3	***7.4***	***4.5***
1962	5.1	***13.1***	***5.4***	***0.5***	5.3	***7.7***	***-1.2***
1963	5.7	***13.***	***5.4***	***4.3***	-2.7	***7.8***	***9.4***
1964	4.0	***14.1***	***5.4***	1.0	0.9	***7.9***	***11.7***
1965	3.5	***13.2***	***5.4***	4.4	4.1	***7.6***	***7.9***
1966	-1.0	***13.8***	***5.4***	10.6	9.7	***11.3***	***2.5***
1967	-0.7	***12.4***	***5.4***	0.4	-3.7	1.5	***5.7***
1968	0.4	***11.3***	***5.4***	-2.9	-0.5	3.2	0.1
1969	2.9	***11.6***	***5.4***	10.6	10.2	0.5	4.0
1970	1.3	***16.7***	***5.4***	1.1	13.8	0.5	2.8
1971	4.2	***14.9***	***5.4***	4.2	16.0	0.5	3.9
1972	3.8	***14.4***	***5.4***	9.8	3.5	3.1	6.2
1973	4.1	***14.0***	***5.4***	11.8	5.4	9.4	11.3
1974	17.6	***13.7***	***5.4***	3.4	12.7	31.1	16.6
1975	7.9	***13.3***	***5.4***	9.1	34.0	30.2	31.7
1976	8.5	***12.6***	***5.4***	23.5	24.3	7.2	1.1
1977	12.6	***11.2***	***5.4***	23.3	15.1	13.7	11.3
1978	9.7	***32.8***	***5.4***	10.1	21.7	13.3	3.4
1979	8.3	***27.7***	***5.4***	7.3	11.7	15.7	9.7
1980	9.4	***24.9***	***5.4***	10.3	10.0	7.2	8.7
1981	12.5	***22.0***	***5.4***	22.9	20.8	6.5	5.9
1982	10.5	***20.3***	***5.4***	11.6	7.7	12.6	17.4
1983	6.2	***17.1***	***5.4***	-2.5	23.2	6.6	11.6
1984	12.4	***24.3***	***5.4***	8.4	17.8	5.4	11.8
1985	7.7	***22.2***	***5.4***	-0.9	7.4	1.8	13.0
1986	8.7	***20.1***	***5.4***	-3.2	5.7	-1.1	6.2
1987	2.7	***19.2***	***5.4***	-6.7	11.3	4.1	-4.1
1988	2.4	50.1	***5.4***	-1.4	54.5	3.0	-1.8
1989	3.3	40.1	***5.4***	-2.8	50.5	1.0	0.4
1990	6.8	47.0	***5.4***	-0.8	7.4	4.2	0.3
1991	8.0	32.9	***5.4***	-7.8	13.0	19.6	-1.8
1992	5.7	45.5	***5.4***	-4.5	44.6	9.6	-0.1
1993	5.2	42.2	***5.4***	-1.2	57.2	12.4	-0.6
1994	5.1	63.2	***5.4***	36.0	57.0	***17.0***	32.3
1995	6.1	54.4	***5.4***	10.6	72.8	***9.8***	7.9
1996	3.0	48.5	***5.4***	5.3	29.3	7.4	2.8
1997	1.0	7.4	***5.4***	2.9	8.5	12.0	1.8
1998	2.8	1.5	***5.4***	4.5	10.0	6.2	1.2
1999	0.7	2.9	***5.4***	-2.3	6.6	-2.4	0.8
2000	1.9	12.7	***5.4***	2.9	6.9	3.0	0.7
2001	0.6	9.0	***5.4***	4.0	18.9	3.3	3.1
2002	2.8	16.8	***5.4***	2.6	12.9	2.0	2.2
2003	1.2	13.4	7.1	-1.6	14.0	7.4	0.0
2004	1.5	12.7	4.1	0.3	15.0	12.3	0.5
2005	1.0	7.2	2.3	7.8	17.9	9.0	1.7
2006	3.3	13.2	5.0	0.0	8.2	8.9	2.1
2007	2.0	8.2	6.5	0.1	5.4	9.1	5.9
2008	3.7	10.3	9.1	11.3	11.6	15.4	5.8
2009	1.0	3.3	9.5	0.6	11.5	10.4	-2.2
2010	1.0	12.7	4.9	0.8	13.7	2.3	1.2
2011	0.9	10.4	5.0	2.9	10.8	5.7	3.4
2012	1.3	2.7	6.7	0.5	12.2	6.3	1.4
2013	1.9	4.3	5.6	2.3	8.5	4.2	0.7
2014	0.4	2.6	5.4	-0.9	8.1	1.8	-1.1
2015	1.6	3.6	3.4	1.0	9.0	2.5	0.1

	SEYCHELLES	SIERRA LEONE	SOMALIA	SOUTH AFRICA	SUDAN	SWAZILAND	TANZANIA
1960	***4.8***	2.30	13.7	1.3	0.1	***8.9***	***12.8***
1961	***5.5***	4.10	9.80	2.1	8.8	***9.3***	***12.8***
1962	***5.9***	-0.90	-0.80	1.2	1.7	***9.5***	***12.8***
1963	***6.1***	0.70	3.30	1.3	4.7	***10.4***	***12.9***
1964	***6.2***	11.5	13.1	2.5	4.0	***10.4***	***18.1***
1965	***6.3***	4.70	12.9	4.1	-2.4	***8.8***	***16.7***
1966	***5.5***	4.30	-3.20	3.5	1.7	3.2	9.8
1967	***5.9***	4.90	-0.30	3.5	11.0	1.8	12.2
1968	***6.1***	1.60	3.40	2.0	-10.0	3.4	15.6
1969	***7.2***	3.10	6.50	3.2	12.6	3.2	16.4
1970	***7.1***	6.40	0.70	4.1	4.0	1.8	3.5
1971	14.6	-1.30	1.80	5.7	1.3	2.3	4.8
1972	20.9	5.50	12.0	6.5	13.6	2.4	7.6
1973	18.2	5.70	11.6	9.6	15.3	11.5	10.4
1974	24.4	14.4	13.1	11.6	26.2	19.3	19.6
1975	18.6	19.9	16.9	12.5	24.0	12.0	26.1
1976	14.9	17.2	14.7	11.0	1.7	6.5	6.9
1977	15.0	8.30	9.80	11.2	17.1	20.8	11.6
1978	11.8	10.9	14.6	11.1	19.2	8.5	6.6
1979	12.5	21.2	13.0	13.3	31.1	16.5	12.9
1980	13.6	12.9	100.9	13.7	25.4	18.7	30.2
1981	10.6	23.4	20.1	15.3	24.6	20.1	25.7
1982	-0.9	26.9	26.8	14.6	25.7	10.8	28.9
1983	6.1	68.5	32.0	12.3	30.6	11.6	27.1
1984	4.1	66.6	71.7	11.5	34.1	12.9	36.1
1985	0.8	76.6	29.6	16.3	45.4	20.5	33.3
1986	0.2	80.9	33.5	18.7	24.5	13.7	32.4
1987	2.6	178.7	32.7	16.2	20.6	13.4	29.9
1988	1.8	34.3	69.8	12.8	64.7	20.4	31.2
1989	1.6	60.8	97.4	14.7	66.7	7.5	25.8
1990	3.9	110.9	215.5	14.3	65.2	13.1	35.8
1991	2.0	102.7	***20.0***	15.3	123.6	8.9	28.7
1992	3.2	65.5	***17.8***	13.9	117.6	7.6	21.8
1993	1.4	22.2	***16.8***	9.7	101.4	12.0	25.3
1994	1.7	24.2	***16.2***	8.9	115.4	13.8	34.1
1995	-0.2	26.0	***16.0***	8.7	68.4	12.3	27.4
1996	-1.1	23.1	***15.8***	7.4	132.8	6.4	21.0
1997	0.6	14.9	***15.8***	8.6	46.7	7.1	16.1
1998	2.6	35.5	***15.7***	6.9	17.1	8.1	12.8
1999	6.3	34.1	***15.7***	5.2	16.0	6.1	7.9
2000	6.3	-0.8	***15.7***	5.3	8.0	12.2	5.9
2001	6.0	2.10	***15.7***	5.7	4.9	5.9	5.1
2002	0.2	-3.3	***15.7***	9.2	8.3	12.0	5.3
2003	3.3	7.60	***15.7***	5.9	7.7	7.3	5.3
2004	3.9	14.2	***15.7***	1.4	8.4	3.4	4.7
2005	0.9	12.1	***15.7***	3.4	8.5	4.8	5.0
2006	-0.4	9.50	***15.7***	4.6	7.2	5.3	7.3
2007	5.3	11.7	***15.7***	7.1	8.0	8.1	7.0
2008	37.0	-35.8	***15.7***	11.5	14.3	12.7	10.3
2009	31.8	9.30	***15.7***	7.10	11.2	7.4	12.1
2010	-2.4	16.6	***15.7***	4.3	13.2	4.5	6.2
2011	2.6	16.2	***15.7***	5.0	22.1	6.1	12.7
2012	7.1	12.9	***15.7***	5.7	37.4	8.9	16.0
2013	4.3	10.3	***15.7***	5.4	30.0	5.6	7.9
2014	1.4	7.3	***15.7***	6.4	36.9	5.7	6.1
2015	4.0	8.0	***15.7***	4.6	16.9	***9.6***	5.6

	TOGO	TUNISIA	UGANDA	ZAMBIA	ZIMBABWE
1960	***5.8***	***9.0***	***12.5***	***23.4***	***12.4***
1961	***5.6***	***6.4***	***16.5***	***23.4***	***12.3***
1962	***4.7***	***6.9***	***19.5***	***23.5***	***12.3***
1963	***5.2***	***5.2***	***21.4***	***23.5***	***12.2***
1964	***5.2***	***4.4***	***22.5***	***23.5***	***12.2***
1965	***6.5***	***5.1***	***23.0***	***12.3***	2.50
1966	***5.4***	***7.5***	***23.3***	***12.0***	3.10
1967	-2.3	***5.1***	***23.3***	***16.6***	2.40
1968	0.3	***5.7***	***23.3***	***79.0***	1.40
1969	6.0	***4.2***	***23.3***	***41.9***	0.40
1970	4.5	***5.1***	***23.3***	***32.3***	2.10
1971	6.5	***4.4***	***23.3***	***25.9***	3.00
1972	7.7	***4.5***	***23.3***	***26.0***	2.80
1973	3.6	***4.0***	***23.3***	***23.7***	3.10
1974	12.8	***3.8***	***23.3***	***23.4***	6.60
1975	18.0	***4.8***	***23.3***	***43.5***	10.0
1976	11.6	***5.2***	***23.3***	***25.4***	11.0
1977	22.5	***5.1***	***23.3***	***22.3***	10.3
1978	0.4	***34.0***	***18.4***	***37.1***	5.70
1979	7.5	***5.4***	***19.5***	***39.9***	18.2
1980	12.3	***4.0***	***31.4***	***32.7***	5.40
1981	19.7	***4.0***	108.7	***26.8***	13.2
1982	11.1	***5.1***	49.3	***23.5***	10.6
1983	9.4	***5.3***	24.1	***25.2***	23.1
1984	-3.5	8.9	42.7	***29.9***	20.2
1985	-1.8	7.3	157.7	***75.5***	8.50
1986	4.1	6.2	161.	55.8	14.3
1987	0.1	8.2	200.	47.0	12.5
1988	-0.2	7.2	196.1	51.0	7.40
1989	-0.8	7.7	61.4	123.4	12.9
1990	1.0	6.5	33.1	107.0	17.4
1991	0.4	8.2	28.1	97.6	23.3
1992	1.4	5.8	52.4	165.7	42.1
1993	-1.0	4.0	1.2	183.3	27.6
1994	39.2	4.7	10.0	54.6	22.3
1995	16.4	6.2	6.6	34.9	22.6
1996	4.7	3.7	7.2	43.1	21.4
1997	8.3	3.7	8.2	24.4	18.7
1998	1.0	3.1	0.1	24.5	31.8
1999	-0.1	2.7	5.8	26.8	58.5
2000	1.9	3.0	3.4	26.0	55.9
2001	3.9	2.0	1.9	21.4	76.7
2002	3.1	2.7	-0.3	22.2	140.1000
2003	-1.0	2.7	8.7	21.4	431.7000
2004	0.4	3.6	3.7	18.0	282.4000
2005	6.8	2.0	8.4	18.3	302.1000
2006	2.2	4.5	7.3	9.0	1096.700
2007	1.0	3.4	6.1	10.7	24411.00
2008	8.7	4.9	12.1	12.4	***160.0***
2009	3.3	3.5	13.0	13.4	***1419762.0***
2010	1.8	4.4	4.0	8.5	3.0
2011	3.6	3.5	18.7	6.4	3.3
2012	2.6	5.1	14.0	6.6	3.9
2013	1.8	5.8	5.5	7.0	1.6
2014	0.2	4.9	4.3	7.8	-0.2
2015	1.8	4.9	5.2	10.1	-2.4

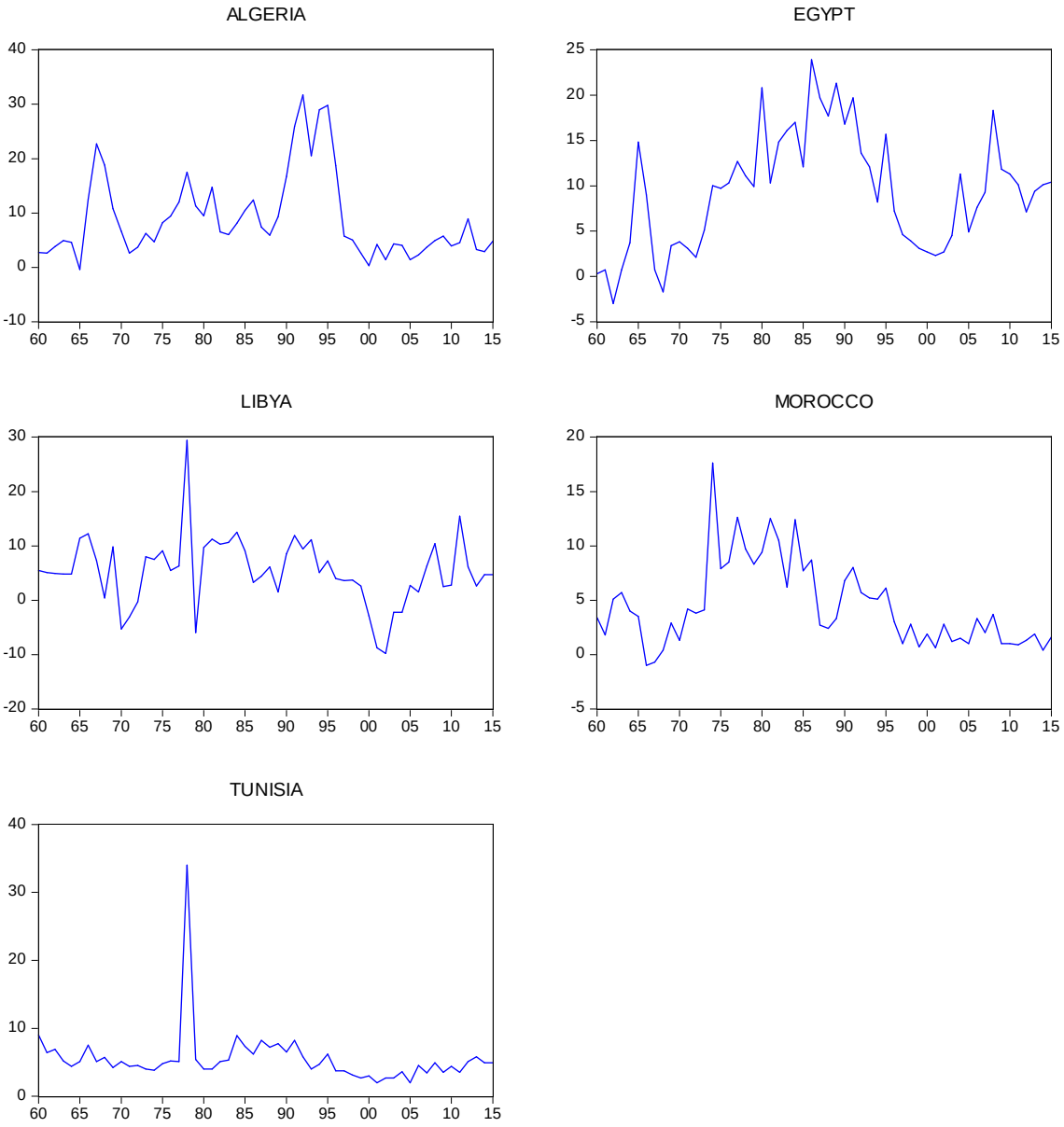

Figure A1: Inflation in North Africa

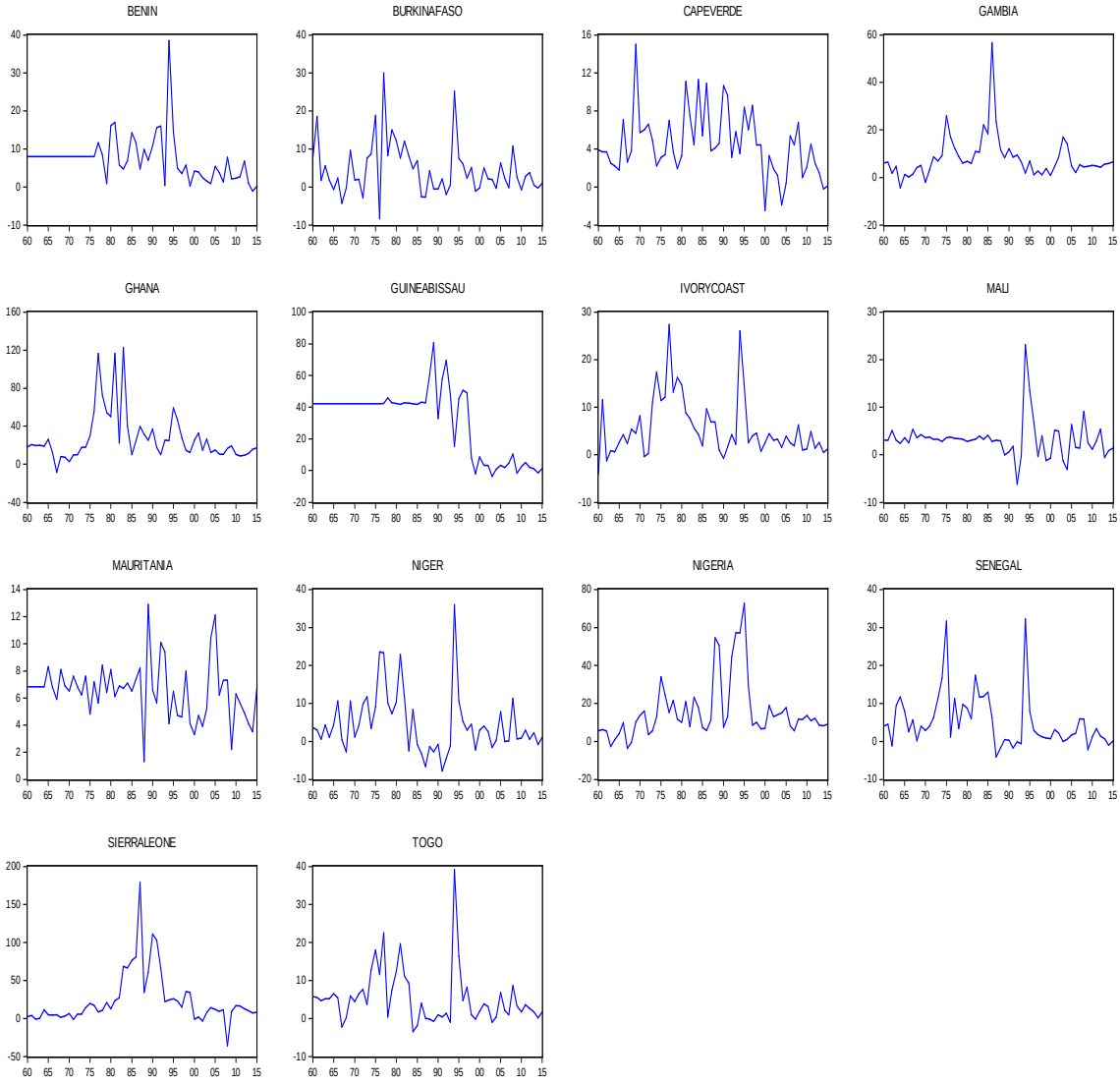

Figure A2: Inflation in West Africa

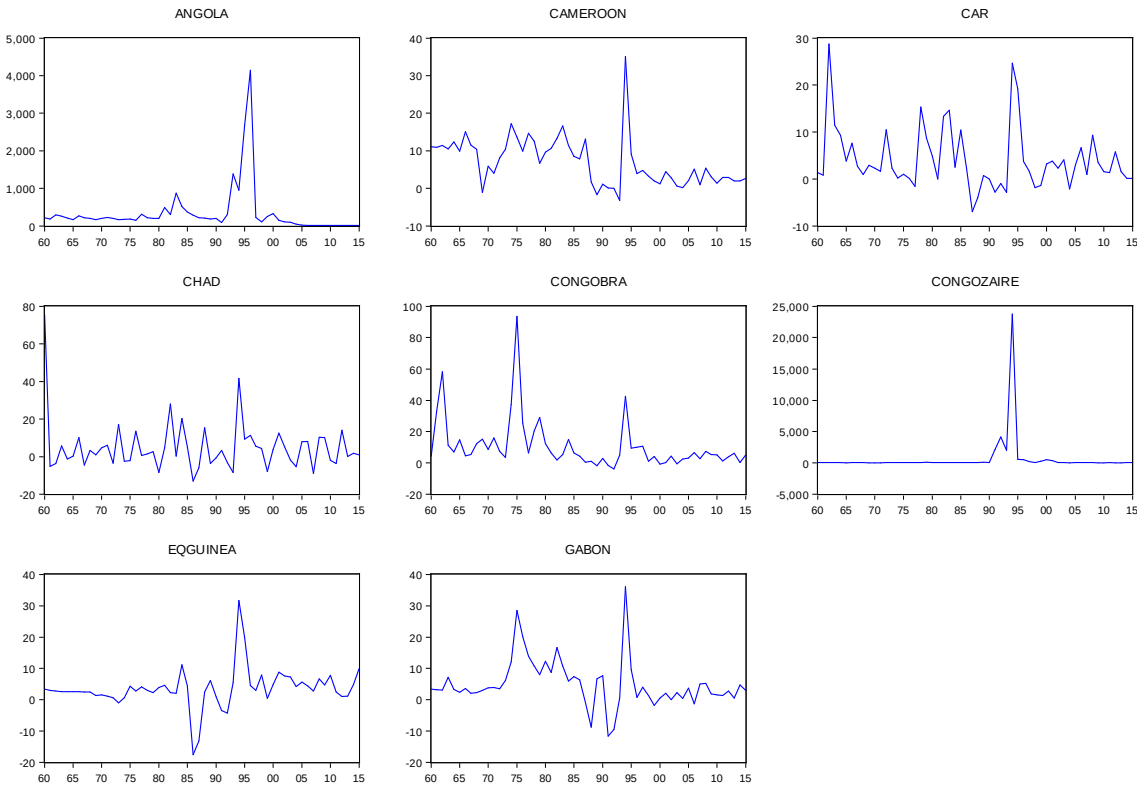

Figure A3: Inflation in Central Africa

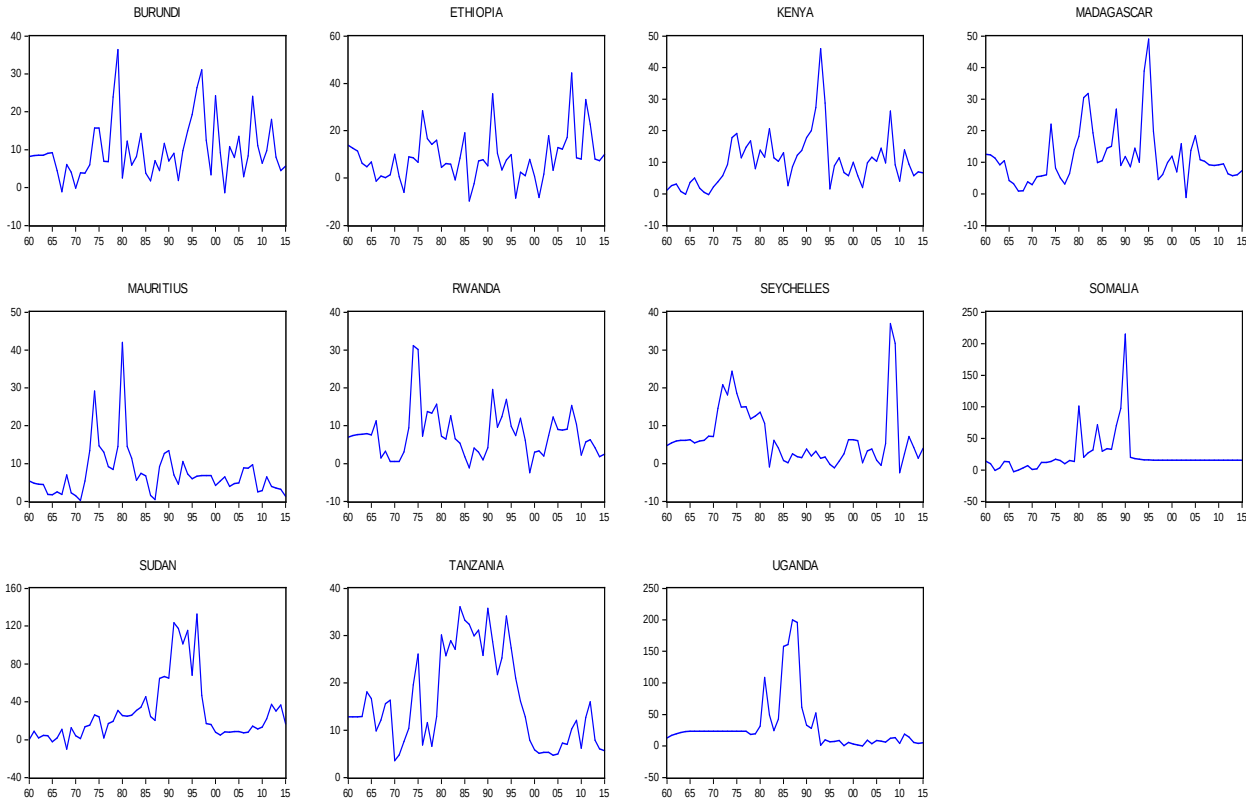

Figure A4: Inflation in East Africa

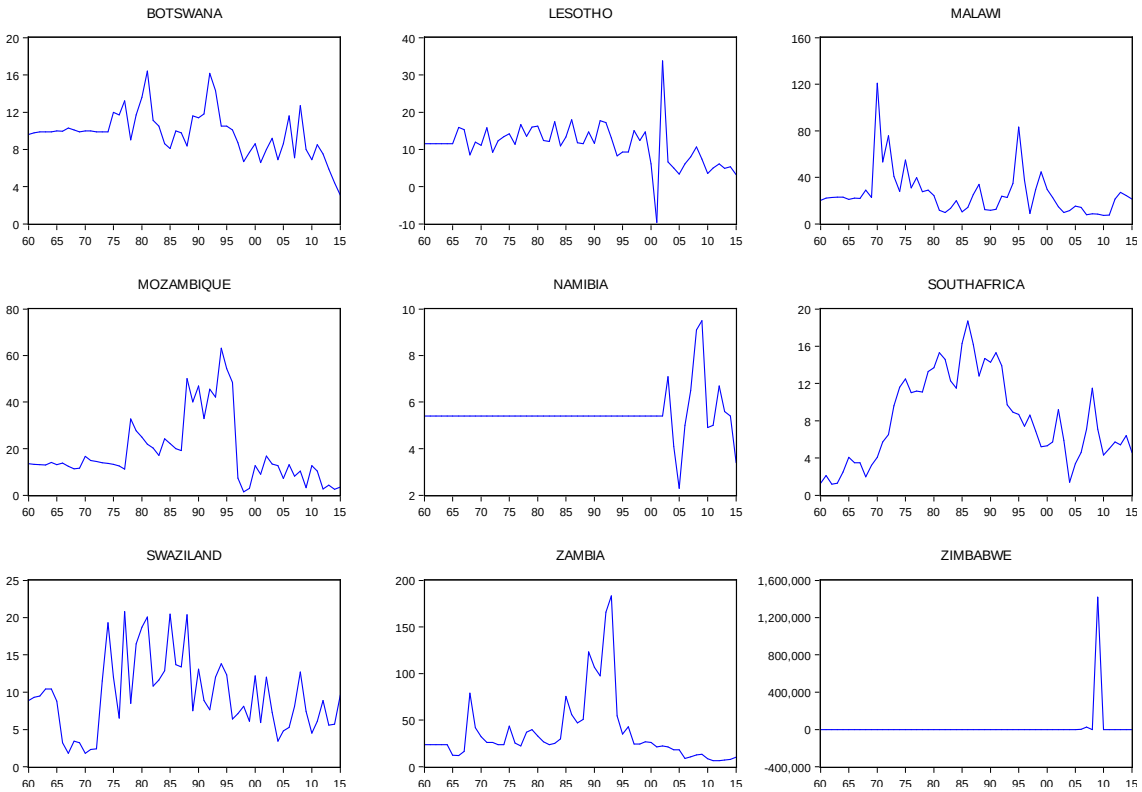

Figure A5: Inflation in South Africa

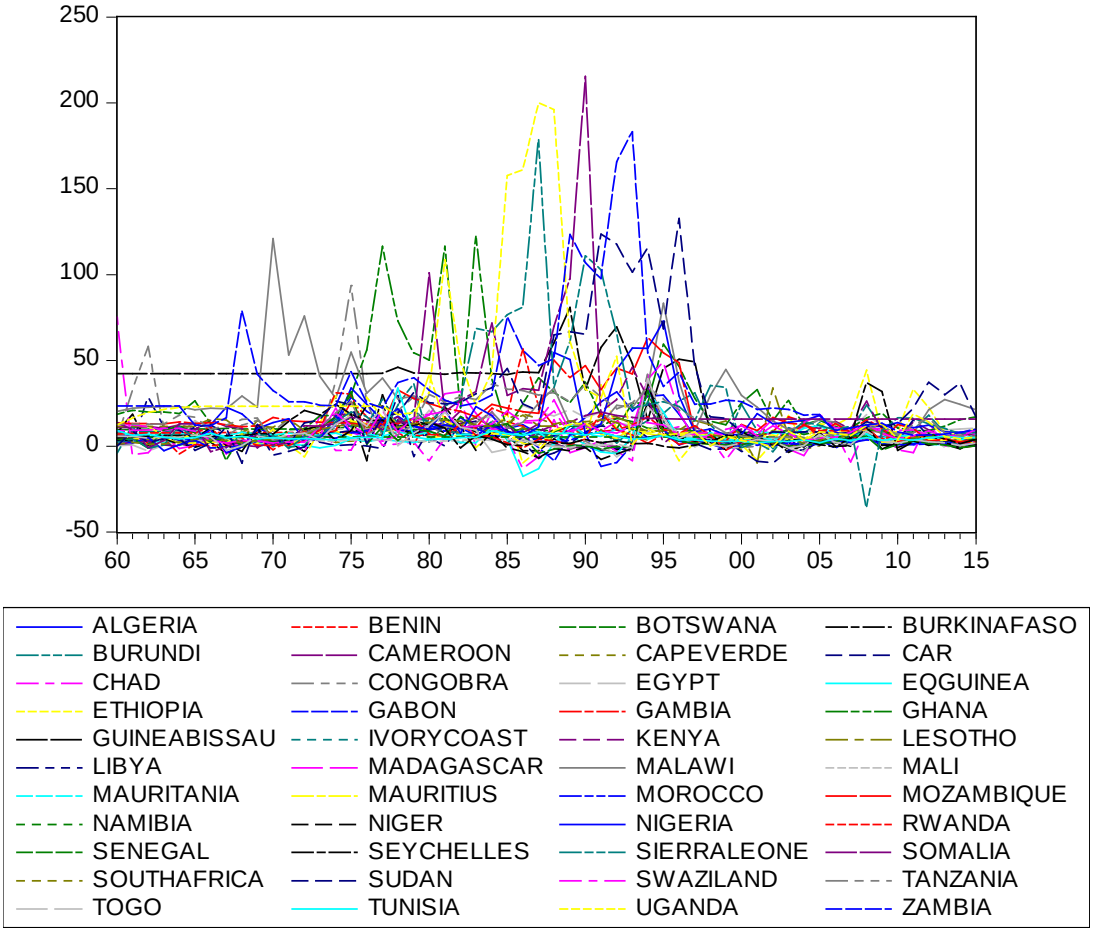

Figure A6: Inflation in all countries, excluding the hyperinflation countries Angola, Democratic Republic of the Congo and Zimbabwe

Figures

Figure 1: the true size of Africa (Source: http://kai.sub.blue/en/africa.html)

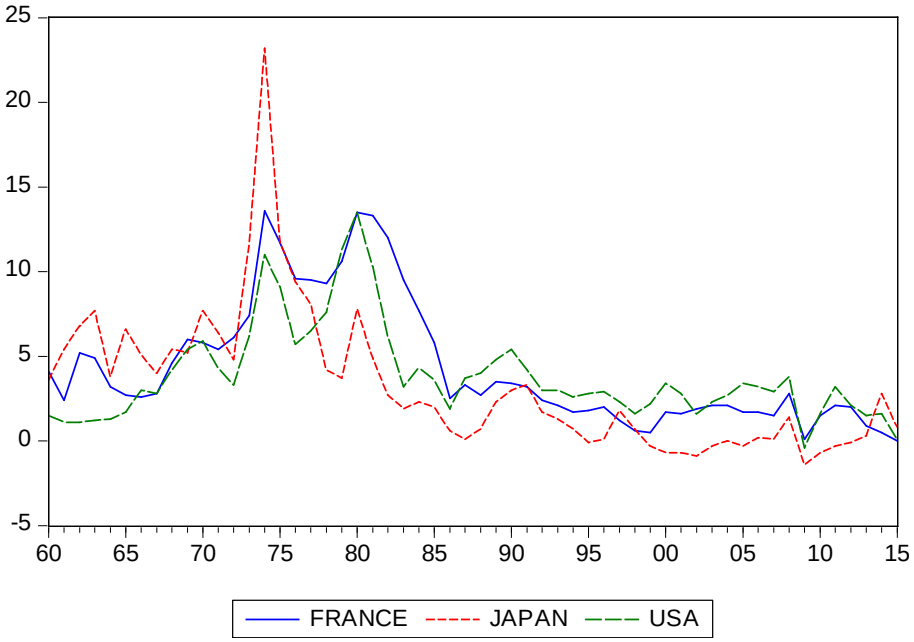

Figure 2: Coherence across inflation rates for three industrialized countries

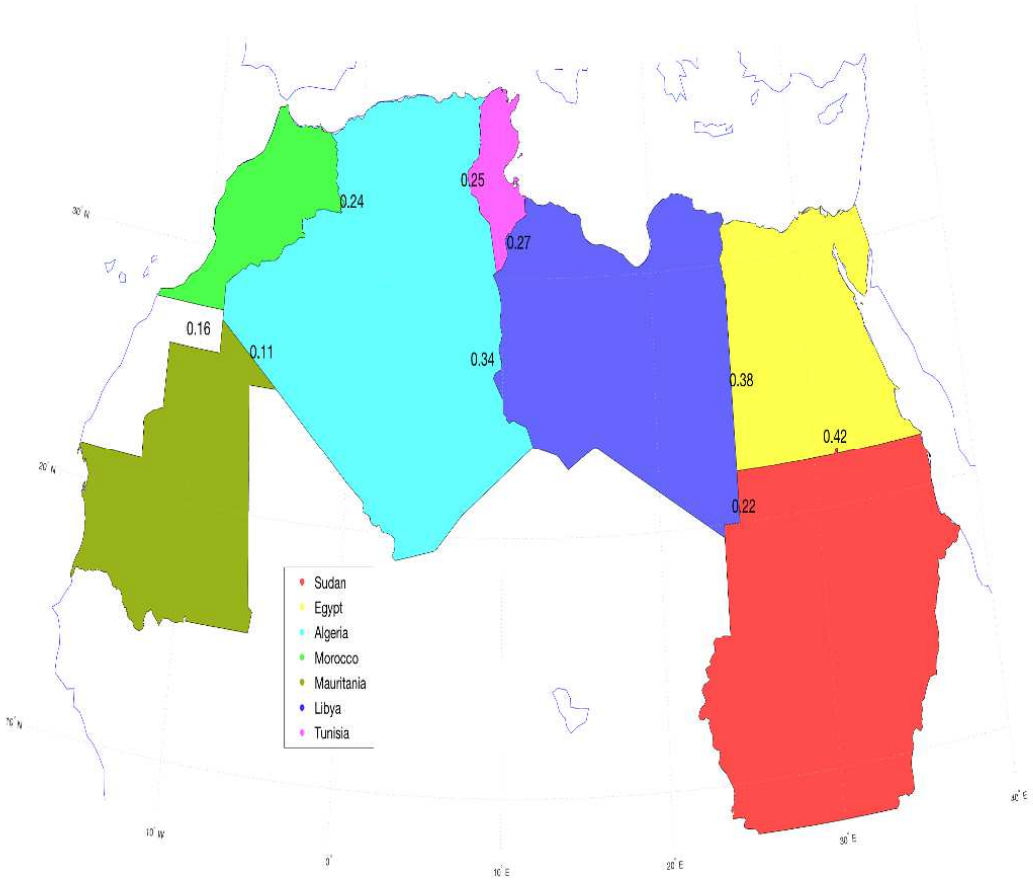

Figure 3a: Correlations between inflation, North Africa

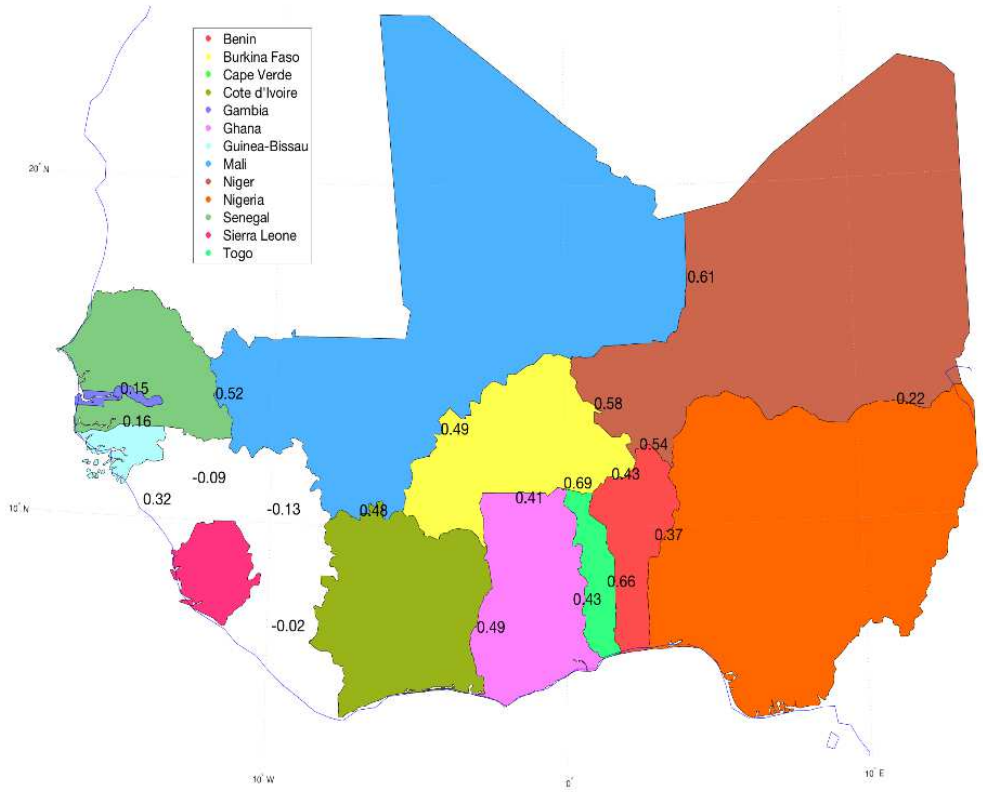

Figure 3b: Correlations between inflation, West Africa

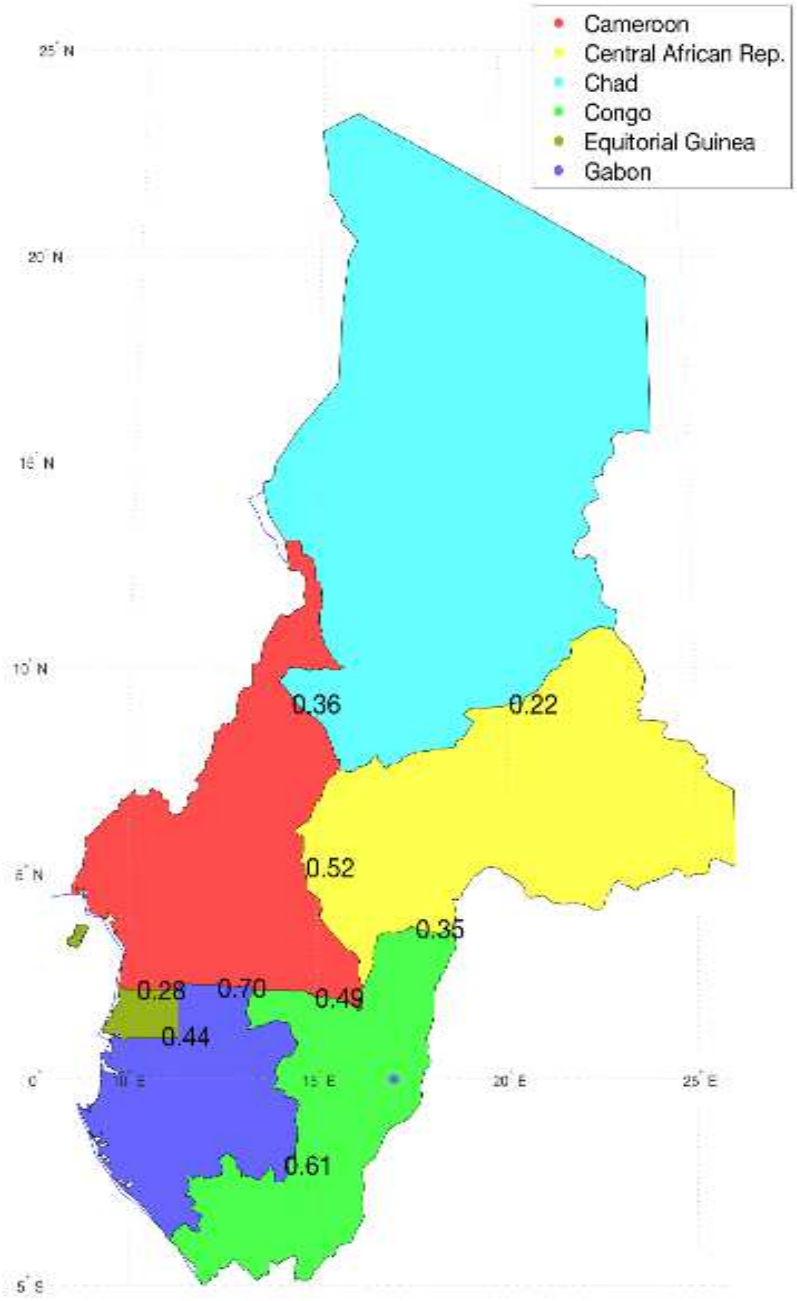

Figure 3c: Correlations between inflation, Central Africa

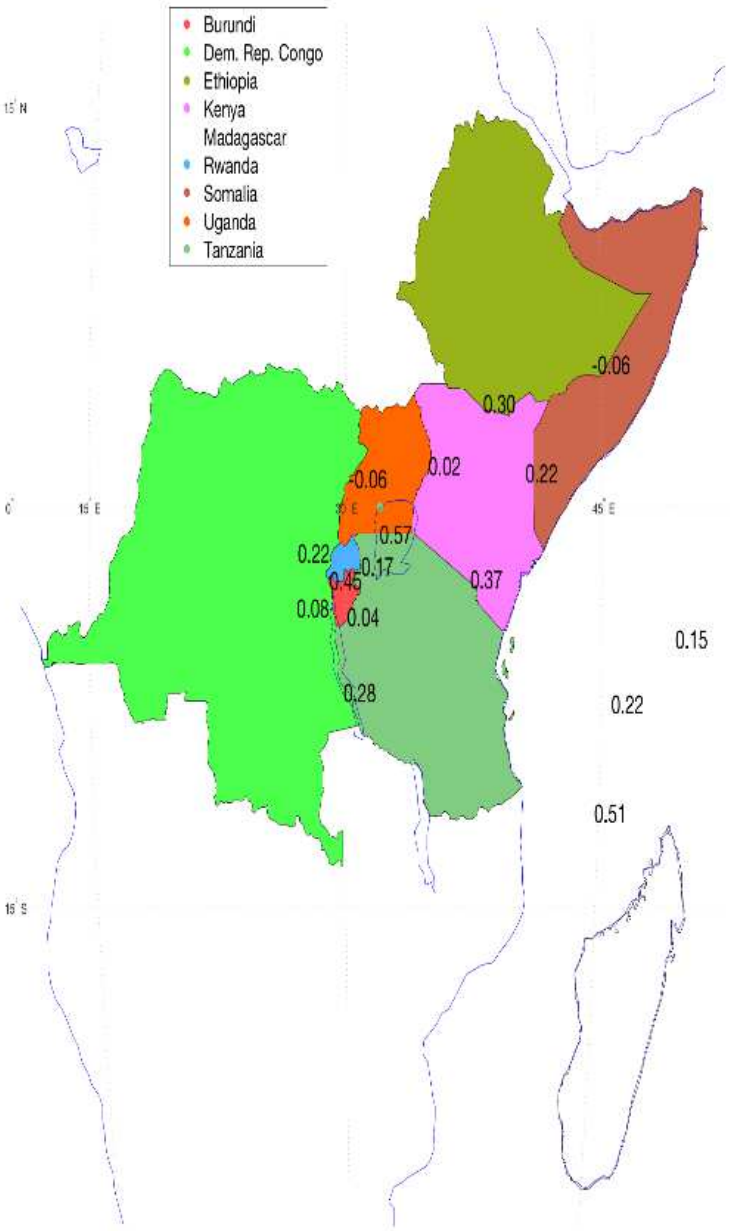

Figure 3d: Correlations between inflation, East Africa

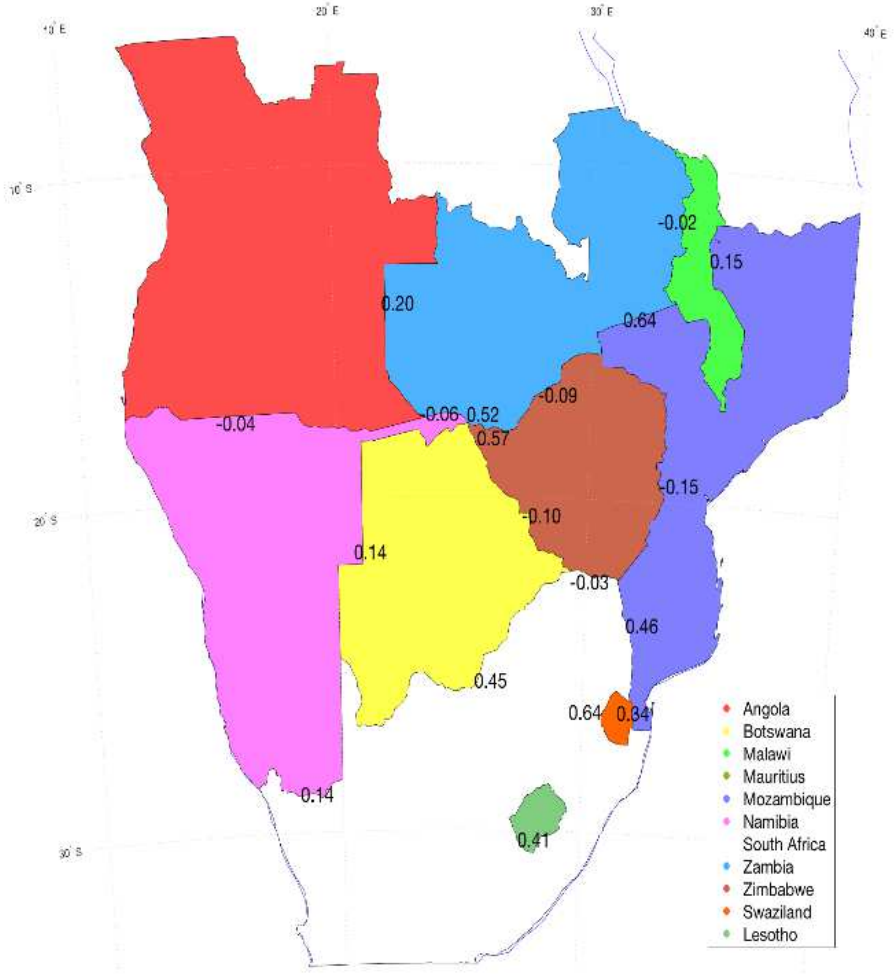

Figure 3e: Correlations between inflation, South Africa

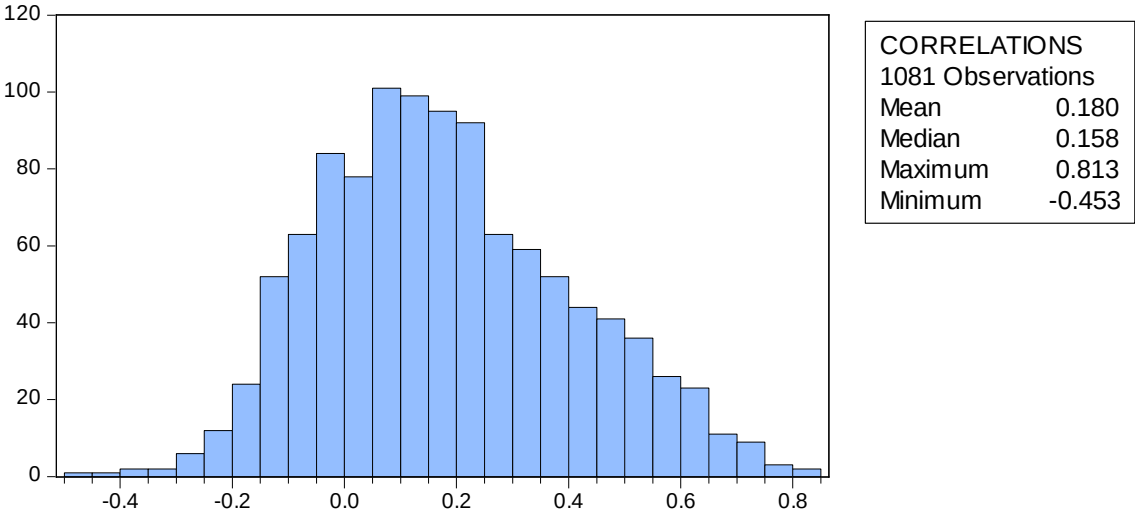

Figure 4a: all correlations across 47 countries

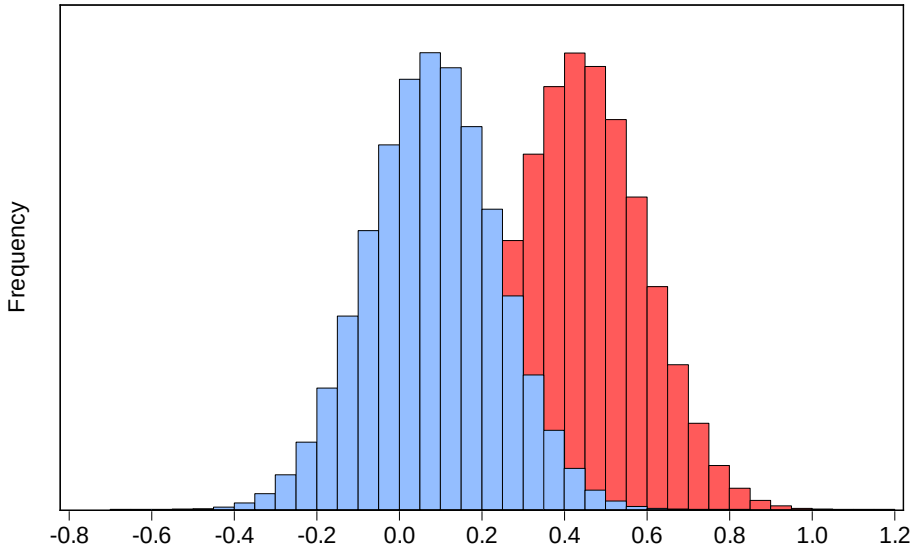

Figure 4b: A mixture of two normal distributions

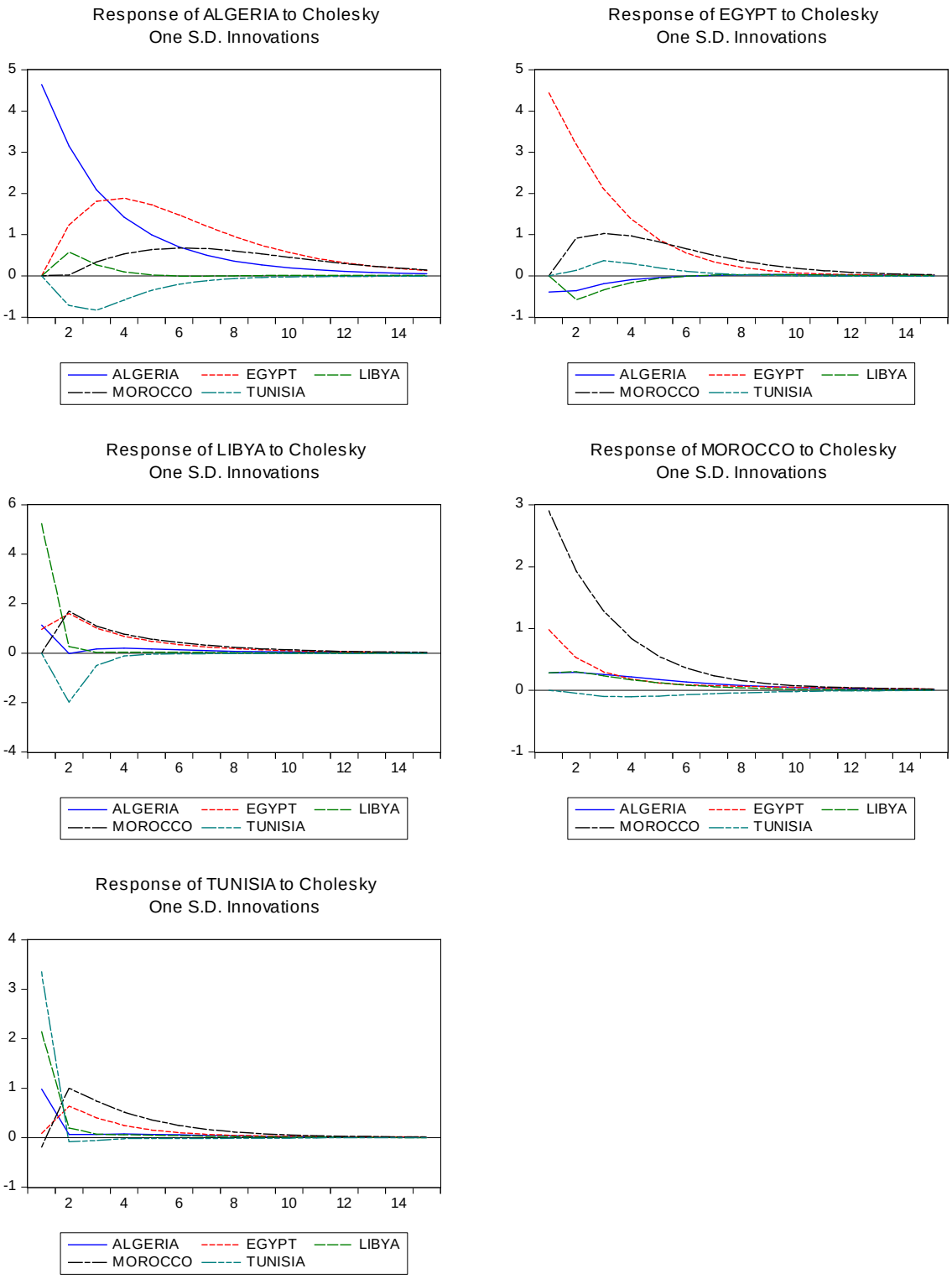

Figure 5a: Impulse Response Functions, VAR(1), North Africa

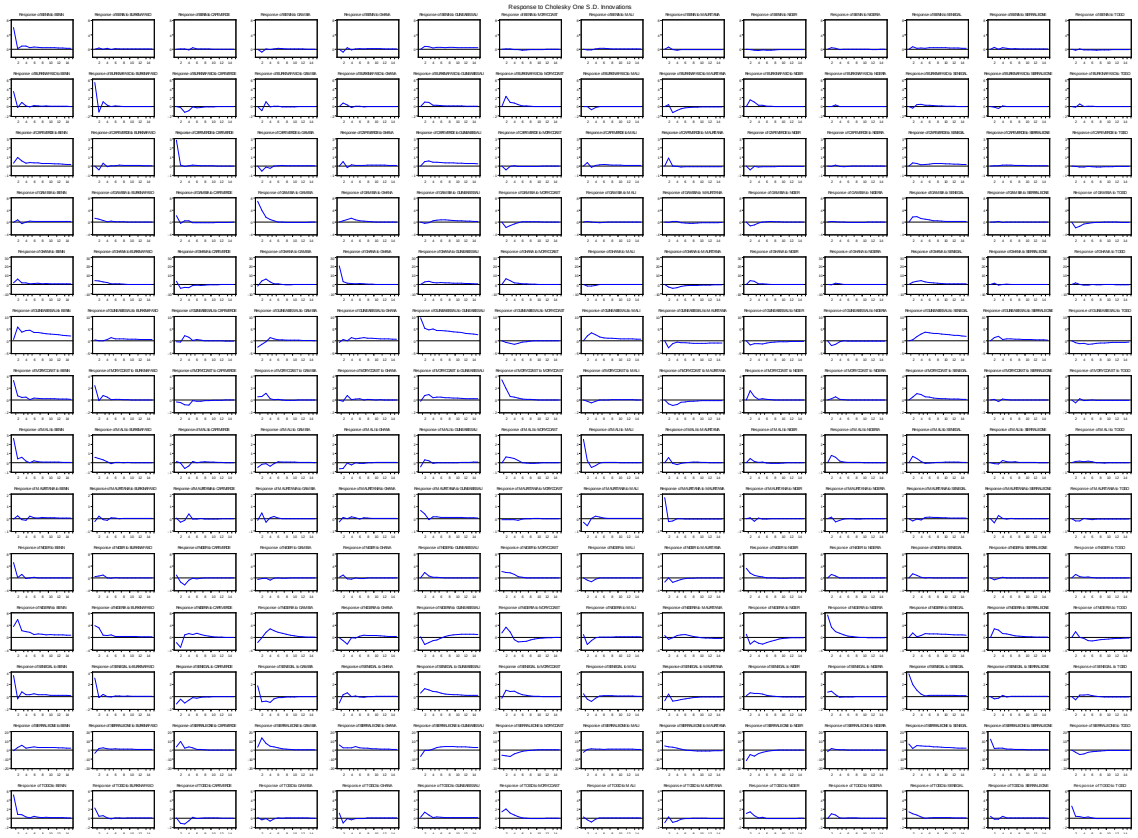

Figure 5b: Impulse Response Functions, VAR(1), West Africa

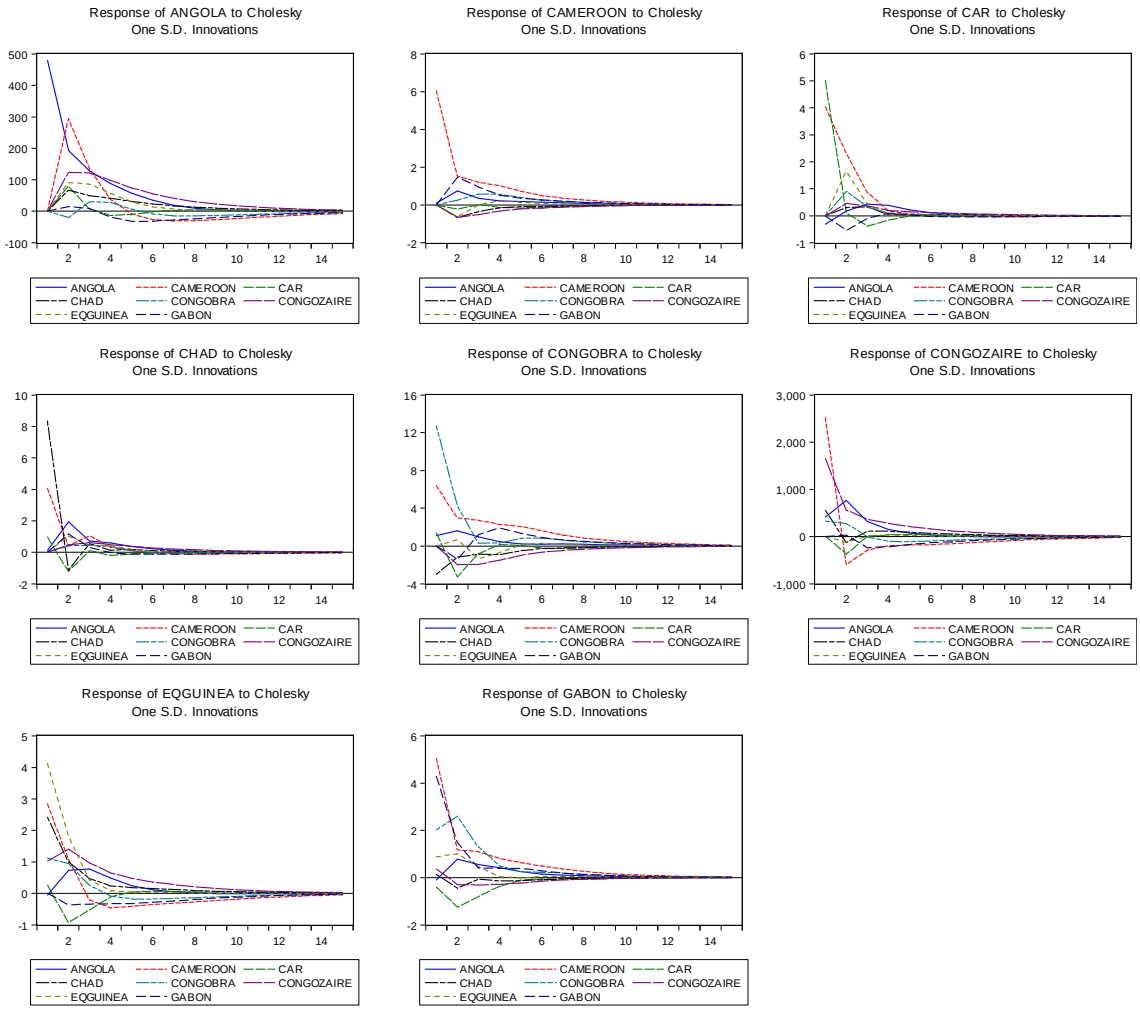

Figure 5c: Impulse Response Functions, VAR(1), North Africa

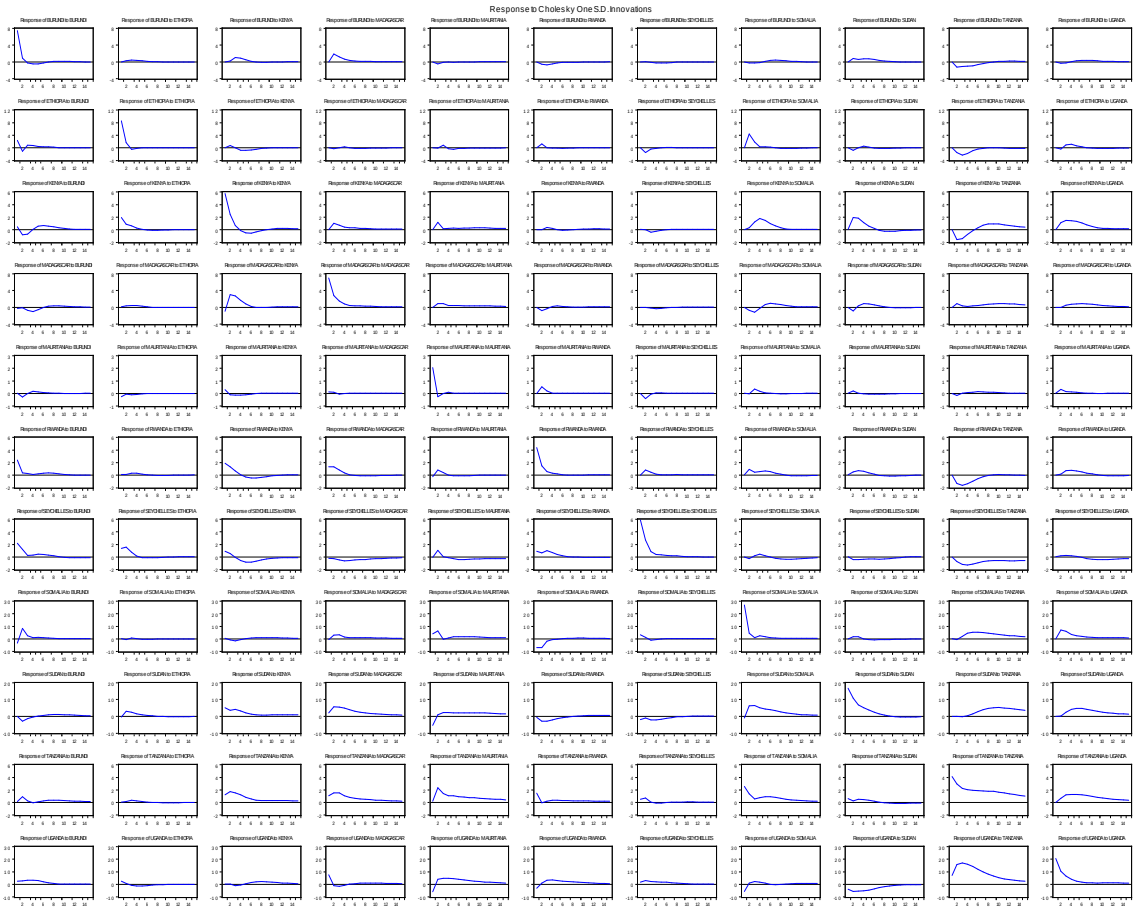

Figure 5d: Impulse Response Functions, VAR(1), North Africa

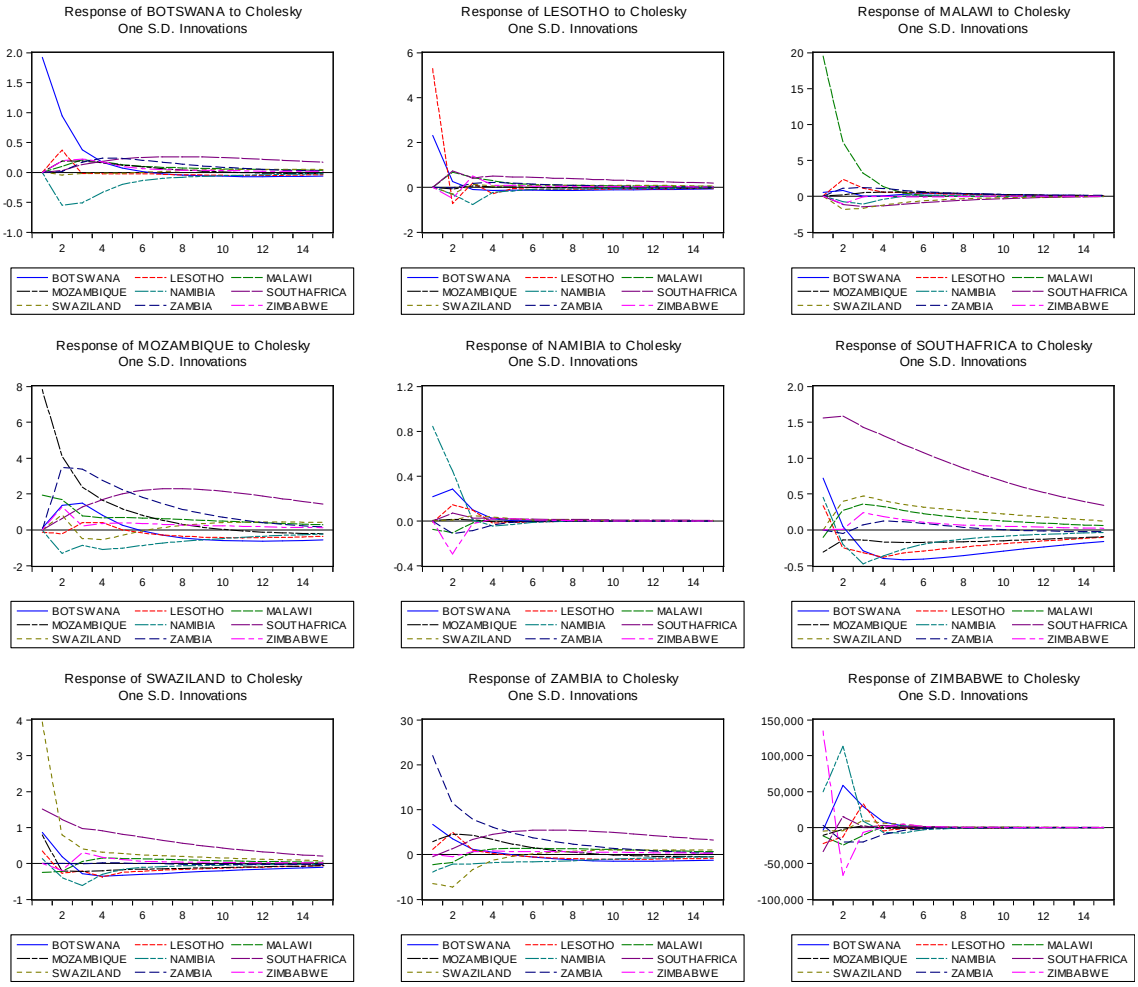

Figure 5e: Impulse Response Functions, VAR(1), North Africa

Tables

Table 1: Summary statistics on inflation

	Mean	Median	Minimum	Maximum (year)
Algeria	8.96	5.95	-0.4	31.7 (1992)
Angola	339	201	7.3	4145 (1996)
Benin	7.34	8.0	-1.1	38.5 (1994)
Botswana	9.754	9.9	3.1	16.4 (1981)
Burkina Faso	4.577	2.35	-8.4	30.0 (1977)
Burundi	9.893	8.25	-1.4	36.5 (1979)
Cameroon	6.982	5.6	-3.2	35.1 (1994)
Cape Verde	4.504	3.85	-2.5	15.0 (1969)
Central African Republic	4.132	2.3	-7.0	28.7 (1962)
Chad	4.789	2.1	-13.1	75.3 (1960)
Republic of Congo	10.614	5.35	-3.9	93.6 (1975)
Democratic Republic of Congo	642.67	32.1	-2.7	23773.1 (1994)
Egypt	9.264	9.8	-3.0	23.9 (1986)
Equatorial Guinea	3.596	2.85	-17.6	31.8 (1994)
Ethiopia	8.614	7.7	-9.8	44.4 (2008)
Gabon	4.995	3.45	-11.7	36.1 (1994)
Gambia	8.041	6.0	-4.5	56.6 (1986)
Ghana	27.673	19.15	-8.4	122.9 (1983)
Guinea Bissau	31.213	42.3	-3.5	80.8 (1989)
Ivory Coast	5.586	3.95	-4.0	27.4 (1977)
Kenya	10.271	9.35	-0.2	46.0 (1993)
Lesotho	11.196	11.5	-9.6	33.8 (2002)
Libya	5.304	5.1	-9.8	29.4 (1978)
Madagascar	11.725	9.7	-1.2	49.1 (1995)
Malawi	26.179	22.75	7.4	121.0 (1970)
Mali	3.180	3.1	-6.2	23.2 (1994)
Mauritania	6.532	6.75	1.3	12.9 (1989)
Mauritius	7.407	6.25	0.3	42.0 (1980)
Morocco	4.454	3.35	-1.0	17.6 (1974)
Mozambique	18.741	13.45	1.5	63.2 (1994)
Namibia	5.479	5.4	2.3	9.5 (2009)
Niger	4.502	2.9	-7.8	36.0 (1994)
Nigeria	15.948	11.4	-3.7	72.8 (1995)
Rwanda	7.734	7.2	-2.4	31.1 (1974)
Senegal	5.104	2.95	-4.1	32.3 (1994)
Seychelles	6.959	5.4	-2.4	37.0 (2008)
Sierra Leone	23.770	12.5	-35.8	178.7 (1987)
Somalia	23.171	15.7	-3.2	215.5 (1990)
South Africa	8.195	7.1	1.2	18.7 (1986)
Sudan	28.486	17.0	-10.0	132.8 (1996)
Swaziland	9.554	8.9	1.8	20.8 (1977)
Tanzania	16.145	12.8	3.5	36.1 (1984)
Togo	5.380	3.75	-3.5	39.2 (1994)
Tunisia	5.521	4.9	2.0	34.0 (1978)
Uganda	30.964	20.45	-0.3	200 (1987)
Zambia	36.616	24.45	6.4	183.3 (1993)
Zimbabwe	25844	12.35	-2.4	1419762 (2009)

Table 2a: Potential explanations for peak inflation, North Africa

Algeria *1992*

First year of Algerian Civil War (26 December 1991- 8 February 2002)

Egypt *1986*

Large public sector deficits; Poor economic policy

Libya *1978*

Rising prices of industrial exports; repeated delays of industrial development; USA sanctions on arms sales

Morocco *1974*

Exports did not grow enough to pay for imports of food; Rise of phosphate prices, money not well spent; poor harvests[1]

Tunisia *1978*

Falling phosphate prices; Recession in Europe; European tariffs; General strike, social unrest[2]

[1] Pennell, C.R. (2000), *Morocco since 1830, a history*, London: Hurst & Company
[2] Christopher Alexander (2010), *Tunisia, Stability and Reform in the modern Maghreb*, London: Routledge

Table 2b: Potential explanations for peak inflation, West Africa

Benin *1994*

Devaluation of the CFA (African Financial Community) Franc[3]

Burkina Faso *1977*

Effects of the first worldwide economic crisis

Cape Verde *1969*

Heavy dependence on Portugal (independence only in 1975); poor economic conditions in Portugal (with 1970 peak inflation, highest in Europe))

Gambia *1986*

The Gambian dalasi is allowed to float; 28% drop in real exchange rate[4]

Ghana *1983*

Monetary expansion and excess liquidity supply during 1972-1982; Narrow money supply increased with 40% on average per year[5]

Guinea Bissau *1989*

Dependence on only a few exporting products (cashew nuts); Poor economic policy

Ivory Coast *1977*

Foreign debt; Poor economic policy; Misuse of forest resources[6]

Mali *1994*

Devaluation of the CFA (African Financial Community) Franc

Mauritania *1989*

Social unrest; April 1989 dispute with Senegal, hundreds of deaths; Massive expropriation

[3] http://www.nytimes.com/1994/02/23/world/french-devaluation-of-african-currency-brings-wide-unrest.html?pagewanted=all&mcubz=3
[4] International Monetary Fund Staff Country Report 08/325 (2008), The Gambia: Selected Issues and Statistical Appendix, Washington DC
[5] Sowa, Nii K. and John. K. Kwakye (1993), Inflationary trends and control in Ghana, African Economic Research Consortium, Research Paper 22, Nairobi, Kenya
[6] Repetto, Robert and Malcolm Grillis (1988, editors), *Public Policies and the Misuse of Forest Resources*, Cambridge UK: Cambridge University Press.

Niger *1994*

Devaluation of the CFA (African Financial Community) Franc

Nigeria *1995*

Large fiscal deficits; Poor monetary policy; Lower oil export prices

Senegal *1994*

Devaluation of the CFA (African Financial Community) Franc

Sierra Leone *1987*

Devaluation of the leone in April 1987; Falling world commodity prices (diamonds); Money created to cover fiscal deficit[7] [8]

Togo *1994*

Devaluation of the CFA (African Financial Community) Franc

[7] Keen, David (2005), *Conflict & Collusion in Sierra Leone*, New York: Palgrave
[8] Kallon, Kelfala M. (1994), An econometric analysis of inflation in Sierra Leone, *Journal of African Economies*, 3, 199-230.

Table 2c: Potential explanations for peak inflation, Central Africa

Angola *1996*

Hyperinflation; Poor economic policy; 3 June 1996, dismissal of entire government; Poor foreign exchange rate[9]

Cameroon *1994*

Devaluation of the CFA (African Financial Community) Franc[10]

Central African Republic *1962*

Independence in 1960; in 1962 all other political parties banned by President David Dacko; political and economic instability

Chad *1960*

Independence from France in 1960; Instability; Religious divide

Republic of Congo *1975*

Oil price shocks; Fall in copper prices

Democratic Republic of Congo *1994*

Hyperinflation; Devaluation of the CFA (African Financial Community) France; Central Bank failure[11] [12]

Equatorial Guinea *1994*

Devaluation of the CFA (African Financial Community) Franc

Gabon *1994*

Devaluation of the CFA (African Financial Community) France; State of alert after strikes for higher wages

[9] Lundahl, Mats (2001, editor), *From Crisis to Growth in Africa*, London: Routledge, pages 32-39
[10] Clement, Jean A.P. (1996), Aftermath of the CFA Franc Devaluation, International Monetary Fund, Report May 1996
[11] Nachega, Jean-Claude (2005), Fiscal Dominance and Inflation in the Democratic Republic of the Congo, International Monetary Fund Working Paper WP/05/221
[12] Beaugrand, Philippe (2003), Overshooting and Dollarization in the Democratic Republic of the Congo, International Monetary Fund Working Paper WP/03/105

Table 2d: Potential explanations for peak inflation, East Africa

Burundi *1977*

Landlocked country; Poor economic policies; Effects of worldwide crisis; Lack of Foreign Direct Investment

Ethiopia *2008*

Rapidly rising domestic food prices; Increase in the money supply; Low interest rates; Souring oil prices; Increase in money supply from abroad; War expenditures[13]

Kenya *1993*

Kenyan shilling starts to float in 1993; Coffee prices go up; Donors' foreign aid embargo in 1991/1992[14]

Madagascar *1995*

Rapid expansion of money supply 1993-1994; Cyclone in January 1994; Depreciation of currency[15]

Mauritius *1980*

Strong devaluation of the rupee

Rwanda *1974*

Worldwide economic crisis[16]

Seychelles *2008*

Depreciation of the rupee; Decline in Foreign Direct Investment due to worldwide economic crisis

Somalia *1990*

Outbreak of Civil War, 1988-1991; Political and economic chaos

[13] www.sudantribune.com/spip.php?article27050
[14] www.imf.org/external/pubs/ft/wp/1999/wp9997.pdf
[15] Sacerdoti, Emilio and Yuan Xiao (2001), Inflation dynamics in Madagascar 1971-2000, International Monetary Fund Working Paper WP/01/168
[16] Ruzima, Martin and P. Veerachamy (2015), A study on determinants of inflation in Rwanda from 1970-2013, *International Journal of Management and Development Studies*, 4, 390-401.

Sudan *1996*

Rapid economic growth prior to 1996; Deterioration of exchange rate; Government borrowing from the Central Bank; Weakness in financial discipline[17]

Tanzania *1984*

Inaccurate political leadership; Deficits in government budget; Consequences of 1979-1981 world economic crisis; Reduction in the value of the shilling[18]

Uganda *1987*

Monetary policy to finance fiscal deficits

[17] Gwynvay Hopkins, Peter (2009, editor), *The Kenana Handbook of Sudan*, New York: Routledge
[18] Boesen, Jannik, Kjell J. Havnevik, Juhani Koponen, and Rie Odgaard (1986), Tanzania, Crisis and Struggle for Revival, Scandinavian Institute of African Studies, Uppsala

Table 2e: Potential explanations for peak inflation, South Africa

Botswana	*1981*
Recession in major industrial countries; Sharp decrease in demand for diamonds	
Lesotho	*2002*
Imports 80% of consumer goods from South Africa; Inflation in South Africa to 9.2%; Exports mainly to USA; uncertainty about duty-free access to USA	
Malawi	*1970*
High degree of financial repression; Insufficient working of banking systems	
Mozambique	*1994*
Lack of monetary control; Significant depreciation of currency; Expansionary fiscal policy	
Namibia	*2009*
Global financial crisis; Reduction in demand for main export product (diamonds)	
South Africa	*1986*
In 1985 major foreign debt crisis; Various banks withdrawing credit lines; Devaluation of the rand	
Swaziland	*1977*
Social unrest, strikes, riots	
Zambia	*1993*
Budget deficit financing; December 1992 large depreciation of the kwacha; Uncontrolled money supply	
Zimbabwe	*2009*
Economic sanctions; Mismanagement of country; Inappropriate land reforms; Money creation to sponsor wars; civic unrest	

Table 3: More summary statistics

	Standard deviation	Skewness	Kurtosis
Algeria	7.719	1.417	4.275
Angola	656.63	4.451	23.947
Benin	6.084	2.477	13.459
Botswana	2.451	0.196	4.152
Burkina Faso	6.977	1.485	5.879
Burundi	7.783	1.394	4.957
Cameroon	6.464	1.458	7.431
Cape Verde	3.358	0.731	3.875
Central African Republic	6.696	1.661	6.140
Chad	13.450	3.004	15.434
Republic of Congo	16.191	3.157	14.743
Democratic Republic of Congo	3215.9	6.847	49.573
Egypt	6.397	0.243	2.324
Equatorial Guinea	6.371	0.892	11.229
Ethiopia	10.231	1.181	5.345
Gabon	7.695	1.540	7.896
Gambia	8.933	3.166	16.988
Ghana	26.565	2.248	8.077
Guinea Bissau	21.499	-0.296	2.030
Ivory Coast	6.247	1.619	5.814
Kenya	8.452	1.678	7.323
Lesotho	5.730	0.147	8.220
Libya	6.298	0.449	5.895
Madagascar	9.261	1.921	7.433
Malawi	20.025	2.621	11.526
Mali	3.935	2.377	14.228
Mauritania	2.096	0.415	4.428
Mauritius	6.771	3.008	14.804
Morocco	3.887	1.146	4.087
Mozambique	14.330	1.393	4.195
Namibia	0.971	1.513	11.836
Niger	7.930	1.683	6.730
Nigeria	15.932	1.885	6.091
Rwanda	6.510	1.556	6.475
Senegal	7.104	2.067	8.192
Seychelles	7.885	1.879	6.761
Sierra Leone	34.386	2.296	9.536
Somalia	32.988	4.140	22.630
South Africa	4.685	0.311	1.983
Sudan	33.451	1.780	5.414
Swaziland	5.034	0.616	2.820
Tanzania	9.897	0.561	1.971
Togo	7.180	2.344	10.513
Tunisia	4.212	5.645	38.760
Uganda	45.255	2.712	9.495
Zambia	36.207	2.468	9.146
Zimbabwe	189648.8	7.278	53.986

Table 4: Time series properties

	First order autocorrelation	Fractional differencing (se)	
Algeria	0.772	0.852	(0.129)
Angola	0.519	0.433	(0.122)
Benin	0.199	0.207	(0.119)
Botswana	0.560	0.556	(0.129)
Burkina Faso	0.019	0.111	(0.115)
Burundi	0.285	0.213	(0.119)
Cameroon	0.361	0.279	(0.116)
Cape Verde	0.277	0.246	(0.120)
Central African Republic	0.266	0.120	(0.115)
Chad	-0.128	-0.308	(0.099)
Republic of Congo	0.401	0.315	(0.120)
Democratic Republic of Congo	0.096	0.106	(0.117)
Egypt	0.704	0.498	(0.109)
Equatorial Guinea	0.458	0.350	(0.127)
Ethiopia	0.260	0.209	(0.116)
Gabon	0.433	0.334	(0.120)
Gambia	0.553	0.441	(0.116)
Ghana	0.440	0.357	(0.112)
Guinea Bissau	0.813	0.651	(0.106)
Ivory Coast	0.438	0.405	(0.117)
Kenya	0.595	0.450	(0.117)
Lesotho	0.011	0.115	(0.124)
Libya	0.248	0.227	(0.115)
Madagascar	0.538	0.469	(0.125)
Malawi	0.417	0.339	(0.116)
Mali	0.249	0.009	(0.119)
Mauritania	-0.009	-0.008	(0.116)
Mauritius	0.489	0.393	(0.121)
Morocco	0.654	0.512	(0.111)
Mozambique	0.774	0.714	(0.120)
Namibia	0.371	0.236	(0.134)
Niger	0.365	0.285	(0.118)
Nigeria	0.636	0.528	(0.121)
Rwanda	0.516	0.446	(0.125)
Senegal	0.301	0.253	(0.119)
Seychelles	0.587	0.494	(0.122)
Sierra Leone	0.641	0.479	(0.110)
Somalia	0.391	0.304	(0.117)
South Africa	0.879	0.784	(0.113)
Sudan	0.793	0.636	(0.111)
Swaziland	0.471	0.374	(0.113)
Tanzania	0.809	0.700	(0.114)
Togo	0.318	0.247	(0.120)
Tunisia	0.096	0.083	(0.118)
Uganda	0.781	0.791	(0.125)
Zambia	0.735	0.645	(0.120)
Zimbabwe	-0.019	-0.027	(0.118)

Table 5: Time series properties, correlations

	Correlation with			
	South Africa	France	Japan	USA
Algeria	0.360	0.055	-0.031	0.167
Angola	0.079	-0.042	-0.127	-0.030
Benin	0.320	0.241	0.193	0.241
Botswana	0.446	0.516	0.314	0.531
Burkina Faso	0.150	0.416	0.254	0.385
Burundi	0.109	0.083	-0.053	0.206
Cameroon	0.096	0.444	0.417	0.227
Cape Verde	0.382	0.239	0.075	0.214
Central African Republic	-0.118	0.142	0.003	-0.058
Chad	-0.113	0.026	-0.041	-0.094
Republic of Congo	-0.017	0.418	0.527	0.314
Democratic Republic of Congo	0.071	-0.125	-0.104	-0.070
Egypt	0.765	0.170	-0.106	0.273
Equatorial Guinea	-0.243	-0.124	-0.162	-0.091
Ethiopia	0.087	0.039	0.031	0.079
Gabon	0.215	0.518	0.379	0.400
Gambia	0.587	0.196	0.014	0.116
Ghana	0.435	0.527	0.100	0.414
Guinea Bissau	0.416	0.462	0.438	0.372
Ivory Coast	0.373	0.501	0.390	0.558
Kenya	0.492	0.149	0.003	0.268
Lesotho	0.410	0.319	0.252	0.246
Libya	0.274	0.300	0.196	0.217
Madagascar	0.334	0.169	-0.102	0.180
Malawi	-0.119	0.139	0.288	0.170
Mali	0.002	0.041	0.007	0.013
Mauritania	0.059	0.158	0.151	0.167
Mauritius	0.431	0.654	0.506	0.795
Morocco	0.627	0.788	0.552	0.660
Mozambique	0.460	0.073	-0.089	0.205
Namibia	0.137	-0.054	-0.069	-0.080
Niger	0.072	0.421	0.262	0.363
Nigeria	0.333	-0.026	-0.146	0.095
Rwanda	0.211	0.407	0.487	0.418
Senegal	0.220	0.507	0.416	0.376
Seychelles	0.084	0.387	0.475	0.349
Sierra Leone	0.633	0.017	-0.166	0.052
Somalia	0.462	0.101	-0.070	0.248
South Africa		0.437	0.069	0.505
Sudan	0.460	-0.123	-0.189	0.033
Swaziland	0.643	0.468	0.225	0.461
Tanzania	0.679	0.287	0.040	0.265
Togo	0.154	0.403	0.309	0.344
Tunisia	0.188	0.207	0.064	0.159
Uganda	0.595	0.165	-0.034	0.147
Zambia	0.446	-0.012	-0.035	0.110
Zimbabwe	-0.032	-0.157	-0.151	-0.206

Table 6: Granger causality with USA, based on VAR(1)

	USA does not Granger cause Country	Country does not Granger cause USA
Algeria	0.435	0.688
Angola	0.966	0.659
Benin	0.057	0.444
Botswana	0.005	0.255
Burkina Faso	0.009	0.448
Burundi	0.920	0.918
Cameroon	0.206	0.671
Cape Verde	0.075	0.334
Central African Republic	0.957	0.809
Chad	0.530	0.342
Republic of Congo	0.146	0.606
Democratic Republic of Congo	0.798	0.905
Egypt	0.377	0.463
Equatorial Guinea	0.658	0.269
Ethiopia	0.790	0.146
Gabon	0.007	0.667
Gambia	0.201	0.579
Ghana	0.003	0.467
Guinea Bissau	0.337	0.352
Ivory Coast	0.087	0.105
Kenya	0.209	0.076
Lesotho	0.034	0.318
Libya	0.214	0.958
Madagascar	0.158	0.145
Malawi	0.708	0.358
Mali	0.840	0.614
Mauritania	0.670	0.517
Mauritius	0.001	0.241
Morocco	0.003	0.647
Mozambique	0.836	0.803
Namibia	0.537	0.366
Niger	0.016	0.922
Nigeria	0.430	0.734
Rwanda	0.217	0.313
Senegal	0.021	0.465
Seychelles	0.234	0.659
Sierra Leone	0.675	0.928
Somalia	0.425	0.439
South Africa	0.009	0.620
Sudan	0.636	0.325
Swaziland	0.105	0.334
Tanzania	0.120	0.098
Togo	0.007	0.258
Tunisia	0.447	0.016
Uganda	0.376	0.885
Zambia	0.680	0.959
Zimbabwe	0.939	0.433

Table 7: Fraction of 5% significant off-diagonal elements in VAR(1) model for each of the five regions

	Number of countries	Number	Fraction
North Africa	5	4	20.00%
West Africa	14	19	10.44%
Central Africa	8	5	8.93%
East Africa	11	19	17.23%
South Africa	9	7	9.72%

Table 8: Principal components analysis (eigenvalues EV and percentage variance explained % VE) (Without Angola, Democratic Republic of Congo and Zimbabwe)

Original Data

North Africa		West Africa		Central Africa		East Africa		South Africa	
EV	% VE	EV	% VE	EV	% VE	EV	% VE	EV	% VE
2.348	0.470	5.116	0.365	2.968	0.495	3.167	0.288	3.058	0.382
0.931	0.186	2.360	0.168	1.136	0.428	2.372	0.216	1.316	0.165
0.779	0.156	1.148	0.082	0.707	0.118	1.284	0.117	0.976	0.122
0.586	0.117	1.013	0.072	0.588	0.098	0.968	0.088	0.853	0.107
0.356	0.071	0.906	0.065	0.393	0.066	0.857	0.078	0.759	0.095
		0.901	0.064	0.208	0.035	0.688	0.063	0.457	0.057
		0.601	0.043			0.609	0.055	0.342	0.043
		0.510	0.037			0.374	0.034	0.239	0.030
		0.410	0.029			0.294	0.027		
		0.335	0.024			0.251	0.023		
		0.270	0.019			0.135	0.012		
		0.197	0.014						
		0.129	0.009						
		0.105	0.008						

Residuals from AR(1) regression

North Africa		West Africa		Central Africa		East Africa		South Africa	
EV	% VE	EV	% VE	EV	% VE	EV	% VE	EV	% VE
1.870	0.374	4.747	0.339	3.042	0.507	2.535	0.231	2.127	0.266
1.276	0.255	1.599	0.114	1.086	0.181	1.919	0.175	1.274	0.159
0.867	0.173	1.489	0.106	0.663	0.111	1.386	0.126	1.147	0.143
0.612	0.122	1.171	0.084	0.558	0.093	1.098	0.100	0.966	0.121
0.376	0.075	1.060	0.076	0.381	0.064	1.028	0.094	0.843	0.105
		0.925	0.066	0.271	0.045	0.754	0.069	0.641	0.080
		0.677	0.048			0.658	0.060	0.533	0.067
		0.624	0.045			0.590	0.054	0.469	0.059
		0.501	0.036			0.428	0.039		
		0.375	0.027			0.411	0.037		
		0.330	0.024			0.193	0.018		
		0.238	0.017						
		0.155	0.011						
		0.110	0.008						

Table 9: Properties across 47 countries

Variable	Mean	Median	Maximum	Minimun	Standard deviation
Mean inflation	581.6	8.614	26844	3.180	3766.5
Log of mean inflation	2.548	2.153	10.160	1.159	1.533
Median inflation	13.802	7.200	201.3	2.100	29.091
Log of median inflation	2.073	1.974	5.305	0.742	1.133
Standard deviation	4129.1	7.716	189684	0.971	27658
Log of standard dev.	2.569	2.043	12.153	-0.029	3.226
AR(1) parameter	0.433	0.438	0.879	-0.128	0.252
Fractional differencing	0.359	0.350	0.852	-0.308	0.238

Table 10: Characteristics of the countries (potentially related to inflation)

			Fractionalization			
	Corruption	Democracy	Ethnic	Language	Religion	Urbanization
Algeria	34	3.56	0.339	0.443	0.009	70.7
Angola	18	3.40	0.787	0.787	0.628	44.1
Benin	36	5.67	0.787	0.791	0.554	44.0
Botswana	60	7.87	0.410	0.411	0.599	57.4
Burkina Faso	42	4.70	0.738	0.723	0.580	29.9
Burundi	20	2.40	0.295	0.298	0.516	12.1
Cameroon	26	3.46	0.864	0.890	0.734	54.4
Cape Verde	59	7.94	0.417	0.000	0.077	65.5
Central African Republic	20	1.61	0.830	0.833	0.792	40.0
Chad	20	1.50	0.862	0.864	0.641	22.5
Republic of Congo	20	2.91	0.875	0.687	0.664	65.4
DR of Congo	21	1.93	0.875	0.871	0.702	42.5
Egypt	34	3.31	0.184	0.024	0.198	43.1
Equatorial Guinea		1.70	0.347	0.322	0.120	39.9
Ethiopia	34	3.60	0.724	0.807	0.625	19.5
Gabon	35	3.74	0.769	0.782	0.667	87.2
Gambia	26	2.91	0.786	0.808	0.097	59.6
Ghana	43	6.75	0.673	0.673	0.799	54.0
Guinea Bissau	16	1.98	0.808	0.814	0.613	49.3
Ivory Coast	34	3.81	0.820	0.784	0.755	54.2
Kenya	26	5.33	0.859	0.886	0.777	25.6
Lesotho	38	6.59	0.255	0.254	0.721	27.3
Libya	14	2.25	0.792	0.076	0.057	78.6
Madagascar	26	5.07	0.879	0.020	0.519	35.1
Malawi	31	5.55	0.674	0.602	0.819	16.3
Mali	32	5.70	0.691	0.839	0.185	39.9
Mauritania	27	3.96	0.615	0.326	0.015	59.9
Mauritius	54	8.28	0.463	0.455	0.639	39.7
Morocco	37	4.77	0.484	0.468	0.004	60.2
Mozambique	27	4.02	0.693	0.813	0.676	32.2
Namibia	51	6.31	0.633	0.701	0.663	46.7
Niger	35	3.96	0.652	0.652	0.201	18.7
Nigeria	28	4.50	0.851	0.832	0.742	47.8
Rwanda	53	3.07	0.324	0.000	0.507	28.8
Senegal	45	6.21	0.694	0.708	0.150	43.7
Seychelles			0.203	0.161	0.232	53.9
Sierra Leone	30	4.55	0.819	0.763	0.540	39.9
Somalia	10		0.812	0.033	0.003	39.6
South Africa	45	7.41	0.752	0.865	0.860	64.8
Sudan	14	2.37	0.715	0.719	0.431	33.8
Swaziland		3.03	0.058	0.172	0.444	21.3
Tanzania	32	5.76	0.735	0.898	0.633	31.6
Togo	32	3.32	0.710	0.898	0.660	40.0
Tunisia	41	6.40	0.039	0.012	0.010	66.8
Uganda	25	5.26	0.930	0.923	0.633	16.1
Zambia	37	5.99	0.781	0.873	0.736	40.9
Zimbabwe	22	3.05	0.387	0.447	0.736	32.4

Table 11a: Regression results. The models exclude the data from Angola, Democratic Republic of Congo and Zimbabwe. The numbers in parentheses are White-corrected standard errors. ** is significant at 5%, * is significant at 10%

	Dependent variable (in logs)		
Variable	Mean inflation	Median inflation	Standard deviation
Intercept	2.767 (0.510)**	2.707 (0.547)**	2.809 (0.629)**
Corruption	-0.042 (0.014)**	-0.048 (0.017)**	-0.036 (0.017)**
Democracy	0.195 (0.094)**	0.245 (0.108)**	0.076 (0.090)
Fractionalization			
Ethnic	-0.501 (0.520)	-0.804 (0.578)	0.303 (0.545)
Languages	-0.108 (0.361)	-0.324 (0.356)	0.149 (0.368)
Religion	0.980 (0.428)**	1.094 (0.427)**	0.528 (0.460)
Urbanization	-0.004 (0.005)	-0.002 (0.005)	-0.009 (0.005)*
Sample size	40	40	40
R^2	0.355	0.341	0.391
Joint F test, p value	0.018	0.024	0.008

Table 11b: Regression results. The numbers in parentheses are White-corrected standard errors. ** is significant at 5%, * is significant at 10%

	Dependent variable	
Variable	First order AR parameter	Fractional differencing
Intercept	0.167 (0.278)	0.095 (0.240)
Corruption	-0.003 (0.007)	-0.003 (0.007)
Democracy	0.039 (0.045)	0.043 (0.043)
Fractionalization		
Ethnic	0.003 (0.344)	-0.024 (0.321)
Languages	0.183 (0.194)	0.127 (0.198)
Religion	0.009 (0.185)	0.043 (0.188)
Urbanization	0.002 (0.002)	0.002 (0.002)
Sample size	43	43
R^2	0.085	0.086
Joint F test, p value	0.761	0.753

References

Aisen, A. and F.J Veiga (2006), Does political instability lead to higher inflation? A panel data analysis, *Journal of Money, Credit and Banking*, 38, 1379-1389.

Alesina, A. A. Devlkeschawuer, W. Easterly, S. Kurlat, and R. Wacziarg (2003), Fractionalization, *Journal of Economic Growth*, 8, 155-194.

Alesina, A. and E. La Ferrara (2005), Ethnic diversity and economic performance, *Journal of Economic Literature*, 43, 762-800.

Alper, C.E., N. Hobdari, and A. Uppal (2016), Food inflation in Sub-Saharan Africa: Causes and Policy Implications, International Monetary Fund Working Paper WP/16/247.

Barugahara, F. (2015), The impact of political instability on inflation volatility in Africa, South African Journal of Economics, 83, 56-73.

Bleaney, M. and M. Francisco (2016), Inflation and fiscal deficits in Sub-Saharan Africa, *Journal of African Economies*, 25, 529-547.

Bolt, J. and J. L. van Zanden (2014), The Maddison Project: collaborative research on historical national accounts, *Economic History Review*, 67 (2014), 627-651.

Bos, C., P.H. Franses and M. Ooms (1999), Long memory and level shifts: re-analysing inflation rates, *Empirical Economics*, 24, 427-450.

Caceres, C., M. Poplawski-Ribeiro, and D. Tartari (2012), Inflation dynamics in the CEMAC region, *Journal of African Economies*, 22, 239-275.

Durevall, D., J.L. Loening, and Y.A. Birru (2013), Inflation dynamics and food prices in Ethiopia, *Journal of Development Economics*, 104, 89-106.

Franses, P.H. and E. Janssens (2016), Recovering historical inflation data from postal stamps prices", Econometric Institute Report 2016-33, Erasmus School of Economics.

Hanke, S. H., & Kwok, A. (2009). On the measurement of Zimbabwe's hyperinflation, *Cato Journal*, 29, 353-364.

Hyung, N. and P.H. Franses (2005), Forecasting time series with long memory and level shifts, *Journal of Forecasting*, 24, 1-16.

Lopes da Veiga, J.A., A. Ferreira-Lopes, and T. Neves Sequeira (2016), Public debt, economic growth and inflation in African economies, *South African Journal of Economics*, 84, 294-322.

Ndoricimpa, A. (2017), Threshold effects of inflation in economic growth in Africa: Evidence from a dynamic panel threshold regression approach, African Development Bank Group, Working Paper 249.

Reader, J. (1998), *Africa, A Biography of the Continent*, London: Penguin.