PURCHASING POWER PARITY HYPOTHESIS IN THE SELECTED AFRICAN COUNTRIES

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Oluwatosin ADENIYI,
and Festus O. EGWAIKHIDE*

This paper explores the long-run absolute purchasing power parity (PPP) hypothesis for a sample of 26 African countries, using both the univariate and the panel unit root tests on annual data for the period 1973-2008. The conventional unit root tests essentially failed to reject the null hypothesis of a unit root in the real exchange rates of the countries which were investigated. Evidence, in favor of PPP for only 7 countries was found. Consequently, a volley of panel unit root tests was employed. The results demonstrated that the null of mean-reversion in the real exchange rates of all countries in the sample could not be rejected, implying a breakdown of the PPP in these countries. Therefore, it could be insightful to consider non-linear assessments of adjustment of the exchange rate towards its PPP trajectory. This threshold-type of analysis may convey information useful for policy making.

I. Introduction

A plethora of existing studies have empirically examined the relationship between the equilibrium exchange rate and the relative national price levels. This Purchasing Power Parity (PPP) doctrine states that change in exchange rates between the two currencies is a function of their relative prices. There are, however, two major variants of this hypothesis. First, the absolute PPP which posits that, on average, the purchasing power of a unit of domestic currency should be the same in the foreign economy, when converted at the market exchange rate. Second, the relative PPP remains valid when there is equality in purchasing power parity across both countries. However, the core of subsequent discussion in this paper is steered towards the former tributary of the mainstream thinking on exchange rates and relative national prices. Absolute PPP has been the subject of myriads of empirical studies with no clear consensus. In the vast literature some attempts on the subject have argued in favor of the possibility of a PPP relation in the long-run [e.g., see Abaaf and Jorion (1990), Kim (1990), Glen (1992), Pippenger (1993), Lothian and Taylor (1996), Bahmani-Oskooee and Barry (1997), Taylor et al. (2001), Chortareas and Kapetanios (2004)]. However, there are (also) a handful of rejections documented in the studies of Kravis and Lipsey (1978), Baillie and Suelover (1987),

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Corbey and Ouliaris (1991) and Bahmani-Oskooee (1995). The mixed (nature of) empirical evidence has inspired further empirical studies in search of answers aimed at resolving the inconclusiveness. Earlier enquiries tested the theory by regressing the nominal exchange rate on relative national price levels. PPP was then ascertained if the estimate obtained for relative prices is close to one. Studies of newer vintage differ in their use of more refined statistical approaches, the most notable being testing for unit roots in the real exchange rate. However, most of the data sets used have hardly been Africa-specific. Thus, the primary aim of the present study is to provide an empirical assessment of the PPP theory using an Africa-specific dataset together with the unit root tests with the desirable power properties.

A number of reasons distinguish this attempt. First, we are aware that this is a pioneer effort at an empirical investigation of the PPP using a large sample of African countries, especially over the post-Bretton Woods era. Also, since univariate time series unit root tests have more recently been criticized for their low power with respect to rejecting the null hypothesis of non-stationarity, we imply more robust panel unit root approaches which have not been used in the earlier studies. Finally, rather than a specific focus on cointegration tests as in most studies on Africa [see, Nagayasu (1998), Krichene (1998), Odedokun (2000), and Kargbo (2003)], the use of panel stationarity methods on the real exchange rate of the sample countries is used in this study, to gauge the existence of the PPP phenomenon.

This paper examines the long-run absolute purchasing power parity (PPP) hypothesis using both univariate and panel unit root tests on annual data covering the period 1973-2008 for a sample of 26 African countries. Using the conventional unit root tests, evidence is seen in favour of PPP for only 7 out of the 26 countries selected for this study. However, when panel unit root tests are used, the results shows a breakdown of the PPP in these countries.

The rest of the paper is organised in five sections: Section II is an overview of the movements in exchange rate and the general price level across the selected countries. Section III contains a brief account of some issues within the purchasing power parity literature with specific emphasis on empirical arguments. The empirical model and methodology are presented in Section IV, while results of both the standard univariate and the panel stationarity tests are reported in Section V. Section VI presents the concluding remarks.

1 Rogoff (1996) presents a detailed chronology in the literature on both theoretical and as well as empirical development on purchasing power parity debate. Excellent survey of the literature is also available in Taylor and Taylor (2004) and the relevant references therein.

2 The intuition behind this was that a test of the existence of a cointegration (long-run) relationship between the nominal exchange rate and relative national prices should be equivalent to a test of the stationarity of the real exchange rate, which recalls that:

\[ R_{t} = \left( \frac{P_{t+1}}{P_{t}} \right) \]

where \( P_{t} \) is the price level in country \( i \) in period \( t \) with \( t=1,2, \ldots, N \) and \( r=1,2, \ldots, T \), \( P_{r} \) is the base country price level and \( e_{t} \) is the nominal exchange rate of country \( i \) relative to the real exchange rate.

3 The studies by Holmes (2000) and Kargbo (2003) are insightful Africa-oriented examples. However, both studies tested the relative version of the hypothesis using time series cointegration and simple panel unit root approaches in that order.

4 These 26 African countries are Algeria, Botswana, Burkina Faso, Burundi, Cameroon, Cote d’Ivoire, Egypt, Ethiopia, Gabon, Gambia, Ghana, Kenya, Lesotho, Libya, Mauritius, Madagascar, Morocco, Niger, Nigeria, Rwanda, South Africa, Senegal, Seychelles, Swaziland, Tanzania and Togo.

II. Facts on Exchange Rates and Prices

A fleeting perspective of exchange rate and domestic price across the twenty six sample countries unveils significant differences from country to country and over time, though, still unclear as presented in Tables A-1 and A-2 in Appendix-B. On a more staidly glance, a constellated pattern appears when the growth rate of variables is examined. For ease of description this pattern has been categorized, based on three criterion: Francophone countries, Oil-producing countries and Regional blocs. For the same reason, the years have also been grouped into six periods, mostly on a quinquennial basis.

1. Francophone Countries

The seven Francophone countries\(^1\) in the sample have similar characteristics. The average consumer price index (CPI) during 1973-1977 period (Table A-1) differs but not significantly across these countries. For instance, between 1973 and 1977 the average value of CPI for Togo, Senegal and Cameroon is 19.7, 23.1, and 15.2, respectively. In the period 2003-2008, Togo's CPI moved to 100.8, while CPI of Senegal increased to 103.5. Cameroon has not differed from this trend with an average value which stands at 103.1. The exchange rate of these countries is tied to the French francs, thereby treading the same path. For example, the average exchange rate for these countries between 1973 and 1977 was 232.5, and depreciated to an average of 514.5 by 2003-2008 (see Table A-2). The movements are evident in the values of the growth rate of these variables. Figure 1 represents this group of countries and shows similar trend.

Two countries, Cameroon and Cote d'Ivoire, (in Figure 1), have been chosen to represent the first group of countries with similar trend. Consumer price indices for both countries show a consistent decline over time. Between 1988-1992 and 2003-2008, the CPI fell persistently, lending credence to the price stability goal pursued in these countries. Exchange rate movement, over the periods under consideration, remained consistent across the countries. For example, exchange rate in Cameroon rose between the first and second period before the trough in the third period. These changes depict era of adjustment of exchange rate in these countries. Exchange rate continued to dip between 2003 and 2008, an indication of exchange rate appreciation.

\[ \text{Figure 1} \]

CPI and Exchange rate in Francophone Countries


\(^1\)Burkina Faso, Cameroon, Cote d'Ivoire, Gabon, Niger, Senegal, and Togo.
2. Oil-Producing Countries

Countries (Algeria, Nigeria, Libya and Gabon) known for their oil resources are grouped together to observe the growth rates of their exchange rate and consumer price indices. For conciseness, two countries (Nigeria and Algeria) represent this group in our analysis. Beginning from the first period, the growth rate of exchange rate increased up to the growth between the periods 1983-1987 and 1988-1992, when the inter-periodic growth rate was highest for Nigeria. This period coincided with the era of change in regime with respect to exchange rate administration—the country moved to a managed floating exchange rate regime. The rate of increase in exchange rate however took a dip between 1988-1992 and 1993-1997, coinciding with the time when the growth rate of consumer price index reached its peak following periods of continued growing prices in the country. A similar trend in CPI growth is observed for Algeria which also reached its peak in the same period. The annual growth in exchange rate declined in both countries in the latter periods. However, while CPI stabilized in Nigeria, it increased at a decreasing rate in Algeria.

3. Regional Blocs

A couple of countries are observed to have common trend in the movement of variables in question as a result of their membership of specific regional blocs. Typical examples are the Swaziland-Lesotho-South Africa (Southern bloc) and Kenya-Tanzania (Eastern bloc). There is no coherent common pattern in what may be described as Western bloc (Nigeria–Togo–Ghana) possibly as a result of the separation discussed earlier under the sub-regions. Swaziland is a country in Southern Africa and so, it is no surprise that exchange rate trends tow similar path with that of South Africa (as evident in Figure 3). Between the last four periods, the annual growth in CPI fell and was not as persistent in comparison to the earlier periods. CPI presents a completely different picture indicative of varying domestic monetary policy in these countries even though there is high level of move towards further integration in the region.
shaped the contours of empirical knowledge on a PPP as a tool for international comparisons of not only price differentials but also income. These seminal contributions and empirical attention paid to the PPP hypothesis imperceptibly increases.

For the purpose of this study, these are grouped into those using long span data, cross-country data, and panel data with each category succinctly dealt with.

First, long span studies are premised on the assertion that traditional tests usually fail to reject the random walk model of the real exchange rate due to poor power. Thus, the only way to observe mean reversion in the equilibrium real exchange rate is to use unit root tests on data spanning several decades (a century or even more in most of the applications in this genre) if any rejection of the random walk hypothesis is to be obtained [Frankel (1986), (1990)]. The 1990s witnessed a surge in long-horizon PPP investigation. Aabauf and Jorion (1990), for instance, used annual data covering 1901-1972 for eight bilateral exchange rates and found evidence in support of the PPP hypothesis. A similar outcome was reported by Diebold et al; (1991) in their study of six currencies using data for the Gold standard period. A number of problems are ascribed to this category of studies; the main is their use of both the fixed and flexible exchange rate periods. Papell and Theodoridis (2001) posited that this problem mostly taints whatever conclusions reached regarding real exchange rate movements.

Second, apart from extending coverage in terms of number of years, another approach that has been adopted in the literature is the use of cross-country data. This is opined to improve the power of unit root tests via increase the amount of information available across exchange rates [Rogoff (1996)]. Aabauf and Jorion (1990) used real exchange rate data for ten countries covering the period from 1973 to 1987. Their findings suggest a slight rejection of non-stationarity, an outcome interpreted as evidence in support of equilibrium PPP. However, cross-sectional approaches, by their design, usually fail to deal with potential biases arising from heterogeneity due to country specificities particularly in terms of economic structure [Quah (1994) and Casselli et al. (1996)].

Third, panel data techniques have flourished in terms of PPP applications from around the mid-1990s. Frankel and Rose (1995) employed data for one hundred and fifty countries (1948-1992) and reported the existence of PPP not only for the entire sample, but even for the post-Bretton Woods sub-period. There are, however, sample bias criticisms against such results as they appear to hold true when high inflation countries are included in the regressions. A few studies, specific to Africa, used a variant of the panel methodology. Specifically, Holmes (2000) conducted a test of long-run PPP using a sample of twenty seven African countries with quarterly data over the period 1974-1997. The study found that, PPP was generally rejected by the individual specific unit root tests while the panel t-bar test supported PPP. Four preliminary, although arguable, conclusions are evident:

- There appears to be no consensus in the empirical literature on the existence of PPP.
- This seems true even for samples specific to Africa.
- Low test power has often been blamed for the failure to ascertain PPP; hence, the use of more powerful panel unit root tests have almost become the norm.
- Forth, such tests are yet to be used to test the PPP hypothesis for Africa.

Therefore, in the current study an attempt is made to test this hypothesis with a large and entirely African sample; with details on these stationarity tests being the subject of what follows.

IV. The Model and Data Sources

This section is preoccupied with two key themes. Firstly, is the explanation of both the individual time series mean-reversion tests and the more powerful panel unit root tests used in the subsequent empirical analysis. Secondly, detail on the data to be used in terms of its coverage – across both time and space – and the transformations conducted. However, with respect to the first part, brevity precludes a description of the Augmented Dickey and Fuller (ADF) tests which we discuss in the following section. The issue is discussed on the Levin and Chu (2002) as well as the Im-Pesaran and Shin (2003), panel unit root tests.

The focus here is to provide a formal, without any particular claim to detail, description of the two panel unit root tests employed in the empirical test for existence of PPP in the selected African countries. Levin et al. (2002), (henceforth LLC) assume that the stochastic process \( x_{i,t} \) is observed for a panel of individuals \( i=1, ..., N \) each with a time dimension \( t=1, ..., T \). The intuition is to ascertain if this process is integrated for each individual in the panel. In line with the conventional single time series approach, individual regressions may contain an intercept and time trend. Also, all parameters in the error process are assumed to vary across individuals, except for the first-order autocorrelation coefficients. More formally, LLC considered a sample of \( N \) cross-sectional units observed over \( T \) periods. The process \( x_{i,t} \) is generated by an AR(1) model thus:

\[
x_{i,t} = \left( 1 - \phi_i \right) x_{i,t-1} + \theta_i y_{i,t-1} + \epsilon_i, \quad i=1, ..., N, \quad t=1, ..., T
\]

The primary concern is testing the null hypothesis of unit roots, that is \( \phi_i = 1 \) in expression (1). Subtracting \( y_{i,t} \), from both sides of the expression yields:

\[
1 - \phi_i = \hat{\phi}_i + \hat{\theta}_i y_{i,t-1} + \hat{\epsilon}_i, \quad i=1, ..., N, \quad t=1, ..., T
\]

where the augmented Dickey-Fuller (ADF) and the Kwiatkowski-Phillip-Schmidt-Shin (KPSS) tests are also conducted in our sample on the real exchange rates of the 26 countries. The details on the specification of these tests are however ubiquitous in the literature and hence familiarity dictates its exclusion from this paper.
\[ \Delta y_i = \alpha_i + \beta_i y_{i-1} + \epsilon_i \]

where \( \alpha_i = (1 - \phi_i) \mu_i \), \( \beta_i = -(1 - \phi_i) \) and \( \Delta y_i = y_{i} - y_{i-1} \).

The null hypothesis of unit roots is then stated as:

\[ H_0: \beta_i = 0 \text{ for all } i \] and the alternative as:

\[ H_1: \beta_i < 0, \, i = 1, \ldots, N \]

This formulation of the null hypothesis only allows for homogeneity in the \( \beta_i \)'s across the groups. All individual series are assumed to have unit roots under the alternative hypothesis. Although the null is intuitive under certain conditions, this kind of alternative hypothesis may however be too restrictive, and hence uninformative, especially in empirical works [Maddala and Wu (1999)]. To better approximate reality, Im, et al. (2003), IPS from now on, relax the homogeneity assumption imposed by LLC under the alternative hypothesis. The alternative, in this case, is that:

\[ H_1: \beta_i < 0, \, i = 1, \ldots, N, \beta_i = 0, \, i = N_i + 1, N_i + 2, \ldots, N \]

IPS developed a t-bar statistic for testing unit roots given as:

\[ \sqrt{t_{i,T}} = \frac{\bar{t}_{i,T} - \mu}{\sigma} \Rightarrow N(0,1) \]

where \( \bar{t}_{i,T} = \frac{1}{N} \sum_{t=1}^{N} t_{i,t} \).

Therefore, using data on 26 African real exchange rates, the t-bar statistic is calculated using the mean value of the individual ADF statistics based on each \( \phi_i \).

For sampled African countries annual data covering the period 1973 to 2008, a total of 28 observations per country, was used. The nominal exchange rates and Consumer Price Indices (CPIs) of the selected countries were obtained from online database of the World Bank. The US CPI is collected from the IMF’s International Financial Statistics CD-ROM. Exchange rates are the spot rates in terms of the US dollar (the numeraire currency), while price data are derived from the CPI of each country. The real exchange rate series for the cross-section of countries was calculated. The scope, in terms of years covered, is in consonance with other studies with a significant number of countries in Africa. There is, however, a possibility that the PPP notion than the ADF test suggests. The null hypothesis of stationarity under KPSS is rejected for all countries in their levels, except for Seychelles under constant deterministic trend. KPSS proves to be a more powerful test, especially under constant and trend where the null hypothesis of real exchange rate stationarity of 7 countries (Burkina Faso, Cameroon, Cote d’Ivoire, Gabon, Niger, Senegal, and Togo) cannot be rejected. This implies that out of 26 countries there is a support for PPP in 7, mostly, CFA countries. Overall, there is no evidence to support PPP in a significant number of countries in Africa. There is, however, a possibility that the rejection of PPP for most of the countries in the sample, with the univariate ADF and KPSS tests is an artefact of low power and the consequent increase in the likelihood of rejecting the alternative hypothesis of mean-reversion [Diebold and Nerlove (1990)].

### TABLE 1

Stationarity tests of Real Exchange rate for Twenty-six African countries

<table>
<thead>
<tr>
<th>Country</th>
<th>ADF Constant</th>
<th>ADF Trend</th>
<th>KPSS Constant</th>
<th>KPSS Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>-1.726</td>
<td>-3.175</td>
<td>0.591***</td>
<td>0.133*</td>
</tr>
<tr>
<td>Botswana</td>
<td>2.847</td>
<td>1.283</td>
<td>0.640**</td>
<td>0.220***</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>-1.449</td>
<td>-1.639</td>
<td>0.518**</td>
<td>0.063</td>
</tr>
<tr>
<td>Burundi</td>
<td>9.595</td>
<td>7.222</td>
<td>0.550**</td>
<td>0.182**</td>
</tr>
<tr>
<td>Cameroon</td>
<td>-1.312</td>
<td>-1.433</td>
<td>0.569**</td>
<td>0.072</td>
</tr>
<tr>
<td>Cote d’Ivoire</td>
<td>-1.231</td>
<td>-1.342</td>
<td>0.575**</td>
<td>0.075</td>
</tr>
<tr>
<td>Egypt</td>
<td>2.674</td>
<td>-0.910</td>
<td>0.655**</td>
<td>0.197***</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>1.983</td>
<td>0.955</td>
<td>0.660**</td>
<td>0.201**</td>
</tr>
<tr>
<td>Gabon</td>
<td>-1.717</td>
<td>-1.534</td>
<td>0.548**</td>
<td>0.066</td>
</tr>
</tbody>
</table>

(continued)
study by Holmes (2000) who found support for PPP hypothesis in 27 African countries, using quarterly data over the period 1974 to 1997. Also, a number of studies on developing countries, apart from Africa, subsequently furnish evidence reinforcing Holmes’s results [see, for example, Marcela et al. (2003), Narayan and Prasad (2005), (2006)]. However, a number of studies agree with our conclusion that the PPP conjecture more often than not breaks down in entirely African samples. For instance, O’Connell (1998) used a similar panel unit root tests and found that the real exchange rates of 13 African countries were non–stationary: Also Alba and Papell (2007) provided empirical evidence that PPP fails to hold in their sub–panel of African countries. Of the 84 countries, covering Europe, Latin America, Asia and Africa, used in their investigation, only the sub–panels with countries from the latter two regions exhibited unit roots in RERs. In concluding, Alba and Papell argued that country characteristics such as distance, openness and exchange rate volatility are factors that should be considered in understanding not only whether but also why PPP holds or not.

### TABLE 2

<table>
<thead>
<tr>
<th>Panel Test</th>
<th>Null Hypothesis</th>
<th>Level</th>
<th>1stDifference</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>LLC</td>
<td>Unit root</td>
<td>0.9792</td>
<td>-3.8131</td>
<td>4.7391** I (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.0000)</td>
<td>(0.0001)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>IPS</td>
<td>Unit root</td>
<td>11.2197</td>
<td>-7.4192*</td>
<td>9.2705* I (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.0000)</td>
<td>(0.0001)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>ADF - Fisher Unit root</td>
<td>23.6162</td>
<td>228.2370*</td>
<td>222.2350*</td>
<td>I (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>PP- Fisher Unit root</td>
<td>12.9489</td>
<td>254.8540*</td>
<td>391.692*</td>
<td>I (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
</tbody>
</table>

Notes: * denotes statistical significance at the 0.01 level. The figures in parentheses are the probability of rejection. All estimation and the computation of panel statistics were implemented in E–Views version 6.0. The LLC statistic assumes a common unit root process while in the other tests individual unit root process is the null. The probabilities for both Fisher tests are computed using an asymptotic \( \chi^2 \) distribution. All other tests, however, assume asymptotic normality.

### VI. Concluding Remarks

This study has examined the long-run absolute purchasing power parity using a sample of 26 African countries. Specifically, mean-reversion was tested via the use of both univariate and panel unit root tests with annual data covering the period 1973 to 2008. The findings, in keeping with the received wisdom, shows that the conventional unit root tests largely failed to reject the null hypothesis of a unit root in the RERs of the countries studied. Evidence in favour of PPP was reported only in seven out of the 26 countries. The low power property of the time-series stationarity tests...
proved to be the culprit. Arising from the foregoing, we employed the IPS, LLC, ADF- Fisher chi-square and PP- Fisher chi-square panel unit root techniques. The conclusion from these tests is that null of mean-reversion is not rejected, suggestive that PPP breaks down in the sample countries. Thus, like O'Connell (1998) and Alba and Papell (2007), the results obtained provide little evidence of the PPP phenomenon in entirely African samples. A key policy implication of findings of this study tends to suggest the need for further investigation of the underlying exchange rate policies in Africa. These exchange rate policies for each country must reflect its prevailing economic, social and political conditions. Further, it will be insightful to consider non-linear assessments of adjustment of the exchange rate towards its PPP trajectory. This threshold-type of analysis may convey information useful for the policy.

References


Wei, S.J. and D. Parsley, 1995, Purchasing power dis-parity during the floating rate period: Exchange rate volatility, trade barriers, and other culprits, Manuscript, Harvard University.
Figure A1
Real Exchange Rates of Selected African Countries, 1973-2008
### TABLE A-2

Exchange Rate of selected African Countries

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>4.080</td>
<td>4.114</td>
<td>4.870</td>
<td>12.558</td>
<td>43.706</td>
<td>71.494</td>
<td>71.541</td>
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<tr>
<td>Botswana</td>
<td>0.764</td>
<td>0.860</td>
<td>1.572</td>
<td>1.966</td>
<td>2.968</td>
<td>5.224</td>
<td>5.593</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>232.506</td>
<td>382.828</td>
<td>287.184</td>
<td>486.546</td>
<td>669.532</td>
<td>514.486</td>
<td></td>
</tr>
<tr>
<td>Burundi</td>
<td>82.756</td>
<td>114.216</td>
<td>172.028</td>
<td>280.060</td>
<td>698.620</td>
<td>1090.563</td>
<td></td>
</tr>
<tr>
<td>Cameroon</td>
<td>232.506</td>
<td>382.828</td>
<td>287.184</td>
<td>486.546</td>
<td>669.532</td>
<td>514.486</td>
<td></td>
</tr>
<tr>
<td>Cote d'Ivoire</td>
<td>232.506</td>
<td>382.828</td>
<td>287.184</td>
<td>486.546</td>
<td>669.532</td>
<td>514.486</td>
<td></td>
</tr>
<tr>
<td>Egypt, Arab Rep.</td>
<td>0.392</td>
<td>0.638</td>
<td>0.700</td>
<td>1.916</td>
<td>3.382</td>
<td>3.746</td>
<td>5.836</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>2076</td>
<td>2070</td>
<td>2070</td>
<td>2216</td>
<td>5938</td>
<td>8062</td>
<td>8863</td>
</tr>
<tr>
<td>Gabon</td>
<td>232.506</td>
<td>382.828</td>
<td>287.184</td>
<td>486.546</td>
<td>669.532</td>
<td>514.486</td>
<td></td>
</tr>
<tr>
<td>Ghana</td>
<td>0.000</td>
<td>0.000</td>
<td>0.008</td>
<td>0.032</td>
<td>0.128</td>
<td>0.512</td>
<td>0.913</td>
</tr>
<tr>
<td>Kenya</td>
<td>7.628</td>
<td>8.520</td>
<td>15.366</td>
<td>24.192</td>
<td>36.246</td>
<td>72.838</td>
<td>73.210</td>
</tr>
<tr>
<td>Lesotho</td>
<td>0.770</td>
<td>0.892</td>
<td>1.830</td>
<td>2.618</td>
<td>3.872</td>
<td>7.546</td>
<td>7.076</td>
</tr>
<tr>
<td>Libya</td>
<td>0.300</td>
<td>0.300</td>
<td>0.304</td>
<td>0.286</td>
<td>0.394</td>
<td>0.664</td>
<td>1.281</td>
</tr>
<tr>
<td>Madagascar</td>
<td>46.502</td>
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