CYRUS CHRONICLE JOURNAL (CCJ):

Contemporary Economic and Management Studies in Asia and Africa

An imprint of the CYRUS Institute of Knowledge (CIK)

CYRUS Institute of Knowledge
MAKE A DIFFERENCE
http://www.cyrusik.org/

CYRUS CHRONICLE JOURNAL (CCJ): Contemporary Economic and Management Studies in Asia and Africa

The flagship journal of the CYRUS Institute of Knowledge

Purpose:

The CYRUS Institute of Knowledge (CIK) Journal is a refereed interdisciplinary journal. The editorial objective is to create opportunities for scholars and practitioners to share theoretical and applied knowledge. The subject fields are management sciences, economic development, sustainable growth, and related disciplines applicable to the Middle East, Central Asia (MENA) and North Africa. Being in transitional stages, these regions can greatly benefit from applied research relevant to their development. **CCJ** provides a platform for dissemination of high quality research about these regions. We welcome contributions from researchers in academia and practitioners in broadly defined areas of management sciences, economic development, and sustainable growth. The Journal's scope includes, but is not limited to, the following:

Business Development and Governance
Entrepreneurship
Ethics and Social Responsibility
International Business and Cultural Issues
International Economics
International Finance
Innovation and Development
Institutions and Development
Leadership and Cultural Characteristics
Natural Resources and Sustainable Development
Organization and Cultural Issues
Strategy and Development
Women and Business Development

Authors are responsible for the views expressed and the accuracy of the facts provided. Authors' opinions do not necessarily reflect the position of the CYRUS Institute of Knowledge, the Editor, or the Editorial Advisory Board of **CCJ**.

Editorial Advisory Board Members:

Professor Tagi Sagafi-nejad is the editor of **CCJ**. Dr. Sagafi-nejad is ex-editor of International Trade Journal, the author, in collaboration with John Dunning of The UN and Transnational Corporations: From Codes of Conduct to Global Compact, (2008) and "The Evolution of International Business Textbooks" (2014). He was the Radcliffe Killam Distinguished Professor of International Business, founding Director of the PhD Program in International Business, and Director and Center for the Study of Western Hemispheric Trade at Texas A&M International University (2003-2013). Dr. Sagafi-nejad is well-known internationally and has outstanding credentials to develop The Cyrus Chronicle into a high quality publication. He will be assisted by an editorial board consisting of distinguished members from world-class institutions of higher learning, practice and industry.

Submission Process:

We invite authors to submit their papers and case studies to Editor@Cyrusik.org. We will have a quick turn-around review process of less than two months. We intend to begin with two issues per year consisting of about 5-8 papers and case studies per issue. The first issue is being planned for the fall of 2015. A selected number of papers submitted to the CIK conference will be double-blind reviewed for inclusion in ***THE CCJ***. We intend to have special issues on themes that are within the scope of Journal. Also, we will have invited guest issues.

THE CCJ: An imprint of the CYRUS Institute of Knowledge (CIK)

Background:

This is a historical time for the mentioned regions, and The Cyrus Chronicle intends to offer what is most urgently needed. There is no question that organizations and businesses that are capable of analyzing and applying advanced knowledge in management sciences and development are in high demand, and especially during transitional periods. It is an unusual time in the target regions and the world, a time which requires active intellectual participation and contributions. It is the era of revolution in terms of communication, technology and minds for billions of people. It is a time for intellectuals, entrepreneurs, and philanthropists to help enlighten minds and therefore enrich the quality of life for millions. It is a time to focus intensely on the regions' historical characteristics, achievements, human and natural resources, and its significant deficit in development, management sciences, and democracy. CIK's vision, "to cultivate the discourse on human capital potentials for better living," is the appropriate response to current challenges, and the journal is a platform for sharing the perspectives of scholars and practitioner with a wider audience.

CYRUS associates tend to have a foot in two worlds. First, most of the associates possess a wealth of intellectual and experiential knowledge which is enhanced by their active involvement in business, consulting and scholarly research and collegiate teaching. Second, some associates are sons and daughters of the affirmation regions and possess an ethnic identity, language skills, and the insights only embraced by insiders. Third, most of the CIK board of directors' members and associates are well-known scholars, members of editorial boards of journals, and even editors. CYRUS possesses depth, breadth, and a competitive edge to successfully manage chronicle.

CYRUS is committed to developing knowledge that positively contributes to the life of the world citizens, especially, the target regions. CIK is a charitable, educational, and scientific organization that has been in operation since 2011. It is a secular and nonpartisan organization that has many scholars and practitioner as member.

For more information on the Institute, please contact: Editor@Cyrusik.org; Sagafinejad@loyola.edu; Nasgary@Cyrusik.org. ***CYRUS Institute of Knowledge (CIK), Box 380003, Cambridge, MA 02238-0003, USA***

Editor's Introduction

Welcome to the premier issue of ***Cyrus Chronicle Journal (CCJ)****: Contemporary Economic and Management Studies in Asia and Africa.* The journal intends to cover scholarship pertaining to the two vibrant and rapidly growing continents, Asia and Africa. They tend to be either ignored or misunderstood; and there are limited outlets for scholars who work on these countries to share their scholarly outputs. Focusing on these two continents will help researchers from both developed countries as well as these two continents - which together account for the largest portion of the world population and growth. The CCJ intends to fill these gaps. An examination of our mission may shed some light on this question. The primary purpose of the journal is four-fold:

1. To share and promote knowledge of economic, management, and development issues facing countries of Asia and Africa. Focusing on assessment, evaluation, and possible solutions help advance countries in this two continent which has the largest world habitants. Development challenges are global; virtually every country faces problems concerning economic development, sustainability, food and water, population and environmental degradation. Yet no country gains by shunning opportunities that globalization can provide, with the possible exception of a few countries whose leaders lack a full understanding of the opportunities that globalization can offer. To take advantage of such opportunities, knowledge is the primary requisite. And this journal aspires to make a contribution to this body of knowledge.
2. To encourage the generation and dissemination of knowledge by local scholars whose access to mainstream academic outlets may be limited? We know many scholars from academic, public and private sector organizations whose first-hand knowledge of problems and solutions isn't being shared for lack of an appropriate outlet for dissemination. The CCJ may provide an opportunity for spreading such knowledge.
3. To focus on countries that span the northern band of Asia – from China to Turkey – to the northern tier of Africa, areas that have not previously been the subject of much attention. In the past these countries have tended to gain the attention of scholars and the media only in times of manmade or natural crises. But in fact, these nations have many challenges similar to those of others. They wrestle with shortages of food and water and the growth of population and pollution. Although they have educated their own citizens, especially in countries that had been under the shackles of dictatorship for decades, now they have become freer to express ideas in journals such as this.
4. Academic scholarship emanating from the region under the journal's coverage tend to get lost in the academic jungle where the pressure of "publish or perish" leaves behind the younger and less experienced members. This journal will give an opportunity to the scholars with first-hand knowledge of these areas to publish their research and thereby make important contributions to the management and development body of scholarship on which the journal will concentrate. We need to know more about these topics in countries such as Afghanistan, Kazakhstan and Tunisia as well as other countries covered by this journal. The CCJ will provide a platform for established as well as younger scholars who might collaborate with them in their research.

On the journal's operational side, we want to make the publication more accessible to a wide audience across the world, and so, consistent with the 21st century trend toward electronic media, we will publish this journal online. To maintain rigor and originality, articles submitted to the journal will undergo the standard blind review process. Reviewers' anonymous comments are shared with authors, as appropriate.

Submission guidelines and procedures are delineated on the journal's website http://www.cyrusik.org/research/the-cyrus-chronicle/.

As the first editor of the journal, I am pleased and proud to accept this challenge. I bring some experience; my first editorial assignment was as an undergraduate at then Pahlavi University in Shiraz, Iran, a top ranking institution in the region. A few students and I founded and published *Danesh-Pajouh* (knowledge seeker). In those days when freedom of expression was severely limited, we managed to publish one issue in March 1965 before the censors put a stop to the enterprise.

Years later, while directing a doctoral program in international business in Texas in the early 2000s, I also was the co-editor - and eventually editor - of the *International Trade Journal* (ITJ) until my retirement in 2013. Under my leadership *ITJ* acceptance fell below 10%.

As editor of the *CCJ*, I hope to accomplish the goals of the journal elucidated above. In the premier issue, we have already reached a threshold of about 20% in acceptance. Still, *CCJ* needs your support and so I ask for your help in the following ways:

1. Contribute articles;
2. Encourage your colleagues to do the same;
3. Spread the word, especially in countries where *CCJ* can be most effective;
4. Cite the articles published in this journal in your own research when applicable;
5. Attend the annual conferences of the CIK (http://www.Cyrusik.org) that serve as a spawning ground for articles that may ultimately be published in this journal;
6. Give us your feedback by telling us how we can further promote and improve the journal?

Welcome and thank you.

Tagi Sagafi-nejad, Editor

The Rial-Dollar Exchange Rate and Purchasing Power Parity Theory

Mohsen Bahmani-Oskooee
The Center for Research on International Economics
The Department of Economics
University of Wisconsin-Milwaukee
Milwaukee, WI 53201

Sahar Bahmani
College of Business, Economics and Computing
Department of Economics
University of Wisconsin at Parkside
Kenosha, WI 53141

Abstract
Since the 1979 Islamic Revolution in Iran, Iranian currency has depreciated from 70 rials per dollar to as low as some 36000 rials per dollar. Has this movement followed the path predicted by the well-known Purchasing Power Parity (PPP) theory? In this paper we show that the answer is in the affirmative and the dominating factor causing the decline is domestic inflation. Following the theory, we predict a rate of almost 47000 rials to the dollar.

INTRODUCTION

A review of the value of the Iranian rial against the U.S. dollar reveals that it has continuously lost value and mostly since the the 1979 revolution. The free market exchange rate reveals that from 1933 until 1979, the dollar rose from 11.20 rials in 1933 to 98 rials in January 1979. However, the rate as of early 2013 stood at 36,300 rials per dollar.[1] This paper uses the economic theory of purchasing power parity (PPP) to explain this abnormal rise in the rial-dollar exchange rate. If we consider the dollar to be like any other commodity, the price of land, housing, food, television sets and, cars, has risen, why not the price of the dollar? Accordingly then the main explanation for the rise in the dollar must be domestic inflation. Thus, whatever has contributed to domestic inflation in Iran, has also contributed to the increase in the value of the dollar.[2] The PPP theory theory explains the link between the exchange rate and relative prices. This theory is outlined in section II and applied and tested using monthly price data in the post-revolutionary period from January 1979 to July 2015. The results are summarized in Section III.[3]

THE PURCHASING POWER PARITY (PPP) AND TESTING METHOD

Let EX denote the exchange rate between rial and the U.S. dollar. The purchasing power parity theory (PPP hereafter) basically claims that in the long run the exchange rate must be equal to the price ratio of the two countries.[4] Denoting the price level in Iran by PIR and the price level in the U.S. by PUS, the PPP could be outlined by equation (1):

---

[1] The rate is at the closing on January 31, 2016.
[2] Such factors include the Iran-Iraq war, loss of oil revenue, sanctions by the United Nations and the West, and excess supply of money by the Central Bank of Iran.
[3] For history of Iranian rial see Bahmani-Oskooee (2005).
[4] For a review article see Bahmani-Oskooee and Hegerty (2010).

$$EX = \frac{PIR}{PUS} \qquad (1)$$

In order to see if the two variables follow each other, we plot each of them in Figure 1.

[Figure 1 here]

From Figure 1 we see that indeed, the two variables move together most of the time. However, the relation could be spurious unless we establish cointegration between the two variables. If we follow the cointegration concept of Engle and Granger (1987), we show that the two variables are integrated of the same order d, but a linear combination of the two is integrated in an order less than d.

A common practice is to express (1) in a log-linear format as in (2):

$$LnEX_t = \alpha + \beta Ln(\frac{PIR}{PUS})_t + \varepsilon_t \qquad (2)$$

The results of the ADF (define ADF here for the first time and then use ADF subsequently) test applied to the level of both variables as well as to their first-differences are reported in Table 1. It is clear that regardless of the number of lags used in the ADF test, only first-differenced variables are stationary. Therefore, both *Ln EX* and *Ln (PIR/PUS)* are integrated of order one or I(1). Now we must show that a linear combination of the two variables proxied by ε_t is integrated of order zero or I(0).[5] To that end we estimate equation (2) and apply the ADF test to the residuals. The results are as follows:[6]

$$\hat{\alpha} = 9.63 \quad (565.2) \qquad \hat{\beta} = 0.842 \qquad (107.6)$$

$$\overline{R}^2 = 0.96 \qquad ADF\ (10) = -2.61$$

If the PPP is to hold, we would expect the estimate of slope coefficient in (2) to be one which it is not. We would also expect the residuals to be stationary. The ADF test statistics of 2.61 is less than its critical value of 3.76 in absolute value, implying that the residuals are not stationary, thus rejecting the PPP theory.[7]

By assuming the slope coefficient in equation (2) to be one, we also assume that the inflation rate in Iran and inflation rate in the US have a similar impact on the exchange rate, though in opposite directions. Clearly, this cannot be the case since very little trade took place between the two countries during our period of study. To test this hypothesis, we separate the two terms and estimate the following specification:

If PPP is to hold, an estimate of b should be one

$$LnEX_t = a + bLnPIR_t + cLnPUS + \varepsilon_t \qquad (3)$$

and that of c negative one. Furthermore, ε_t should be I(0). The OLS estimate of (3) is as follows:

$$\hat{a} = 10.77(7.52) \quad \hat{b} = 0.88(15.6) \quad \hat{c} = -1.13(3.07)$$

$$\overline{R}^2 = 0.97 \quad ADF\ (10) = -2.64$$

It is clear from the results that the estimate of b is not one and that of c is not negative-one, although they are close to their expected values. These estimates are significant, since the absolute value of the ADF statistic of the residuals is less than the critical value of 3.76, the null of unit root in the residuals cannot be rejected, hence the residuals are non-stationary, rejecting cointegration.[8]

[5] To see why ε_t in (2) is a proxy for the linear combination of two variables, all we need to do is to solve (2) for ε_t..

[6] Numbers inside the parentheses for coefficient estimates are absolute values of the t-ratios. However, number inside the parenthesis next to ADF statistic is number of lags in the test. Note that data on price levels come from International Financial Statistics of the IMF. Data on the rial-dollar rate are mostly from Bahmani-Oskooee (2005) and author's own collection.

[7] Note that we have selected the ADF statistic by minimizing the AIC criterion. However, the ADF statistic was insignificant at all lags (1-12). We also made sure that both *Ln PIR* and *Ln PUS* are I(1).

[8] For some other studies that have tested the PPP using the black market exchange rate see Bahmani-Oskooee

The ADF test applied to the residuals of equation (3) is said to suffer from low power. We therefore, shift to an alternative approach of testing for cointegration that incorporates short-run dynamic adjustment of variables. To this end, we follow Coe and Serletis (2002) and Pesaran et al. (2001) bounds testing approach and rewrite equation (3) in an error-correction format as follows:

$$\Delta LnEX_t = \alpha' + \sum_{k=1}^{n1}\beta_k \Delta LnEX_{t-k} + \sum_{k=0}^{n2}\delta_k \Delta LnPIR_{t-k}$$
$$+\sum_{k=0}^{n3}\phi_k \Delta LnPUS_{t-k} + \lambda_0 LnEX_{t-1} + \lambda_1 LnPIR_{t-1} + \lambda_2 LnPUS_{t-1} + \mu_t \quad (4)$$

Equation (4) is an error-correction model that is similar to the Engle and Granger (1987) specification. The difference is that rather than including lagged error term from (3) we have included its proxy represented by the linear combination of lagged level variables. In order to justify the inclusion of lagged level variables, Pesaran *et al*. (2001) propose applying the familiar F test to establish their joint significance as a sign of cointegration. However, they demonstrate that the F test in this application has new critical values that they tabulate. Since these critical values account for integrating properties of variables, under this method there is no need for pre-unit root testing and variables could be combination of I(0) and I(1), though our variables are all I(1).

Equation (4) is estimated after imposing 12 lags on each variable. Following the literature, we use Akaike's Information Criterion (AIC) to select an optimum model. The selected model was an order of (12, 3, 0) and the normalized log-run coefficients and the F test for joint significance of lagged level variables were estimated to be:

$$\hat{a}' = 9.46(0.98) \qquad \frac{\hat{\lambda}_1}{\hat{\lambda}_0} = 0.79(2.10)$$

$$\frac{\hat{\lambda}_2}{\hat{\lambda}_0} = -0.74(0.30) \qquad F = 2.90$$

From these results it is clear that while the Iranian price level carries a significant coefficient, the U.S. price level does not. This implies that the inflation rate in Iran is more relevant and the main determinant of the rial-dollar exchange rate in Iran. However, the F test applied to the joint significance of lagged level variables is insignificant given its upper bound critical value of 4.14 at the 10% level of significance.[9] However, according to Bahmani-Oskooee and Tanku (2008), there is an alternative way of establishing cointegration. Using the long-run coefficient estimates and long run model we generate the error term, usually called error-correction term labeled as ECM. We then replace the linear combination of lagged level variables in (4) by ECM_{t-1} and estimate the resulting specification at the same optimum lags. A significantly negative coefficient for ECM_{t-1} will support convergence toward long run or cointegration. Once this specification was estimated, the coefficient estimate of ECM_{t-1} was -0.03 with a t-ratio of -2.87, supporting cointegration.

SUMMARY AND CONCLUSION

Since the Islamic Revolution in 1979, the Iranian rial has been under pressure and has lost much of its value. The free market rial-dollar rate has gradually moved from 70 rials per dollar to 36,300 rials per dollar as of February 2013. While most of the pressure in late 2011 and 2012 is attributed to economic sanctions by the U.N., and the U.S. and other Western countries, we demonstrate that during the last three decades, inflation in Iran has been the main source of the devaluation of the rial.

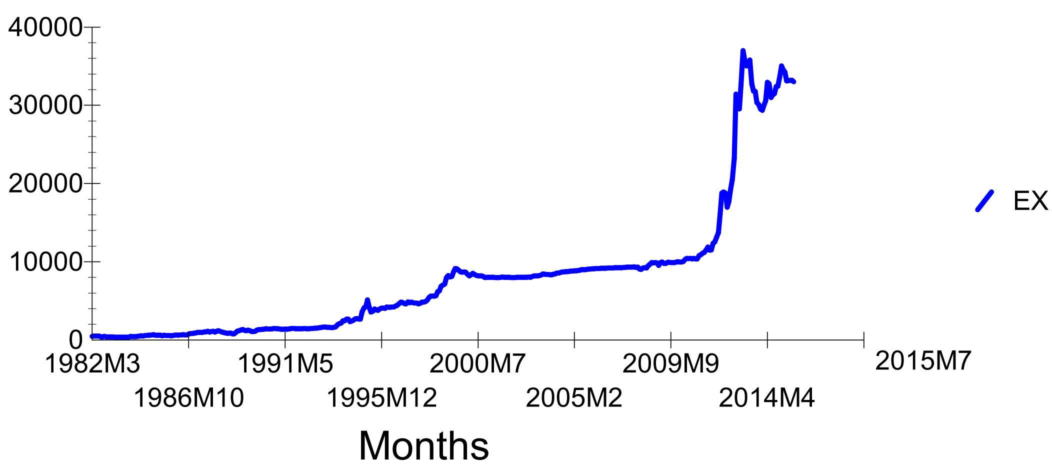
In this paper we tried to establish the link between the rial-dollar rate and inflation differential between Iran and the U.S., following the purchasing power parity theory. Using monthly data from January 1979 – July 2015, our empirical results reveal that the dominating factor in the decline of the rial is domestic inflation. During the study period, the Iranian Consumer Price Index has moved up from 0.43 to almost

(1993), Phylaktis and Kassimatis (1994), El-Sakka and McNabb (1994), Sanchez-Fung (1999), Kargbo (2003), Chortareas and Kapetanios (2004), and Bahmani-Oskooee and Goswami (2005).

[9] This critical value comes from Pesaran *et al.* (2001, Table CI, Case III, p. 300).

288, an increase of 670-fold. If we were to increase the price of the dollar by this ratio, we would expect a rate of 46,900 rials per dollar.
Thus, the current rate of almost 37,000 rials per dollar is almost 20% less than the PPP would predict. Indeed, this is reflected in coefficient estimates of the Iranian inflation rate in model (4) and could be due to imperfections in the PPP or intervention by Iran's Central Bank.

Figure 1: Plot of the Rial-dollar rate (EX) and Relative Prices (RP).



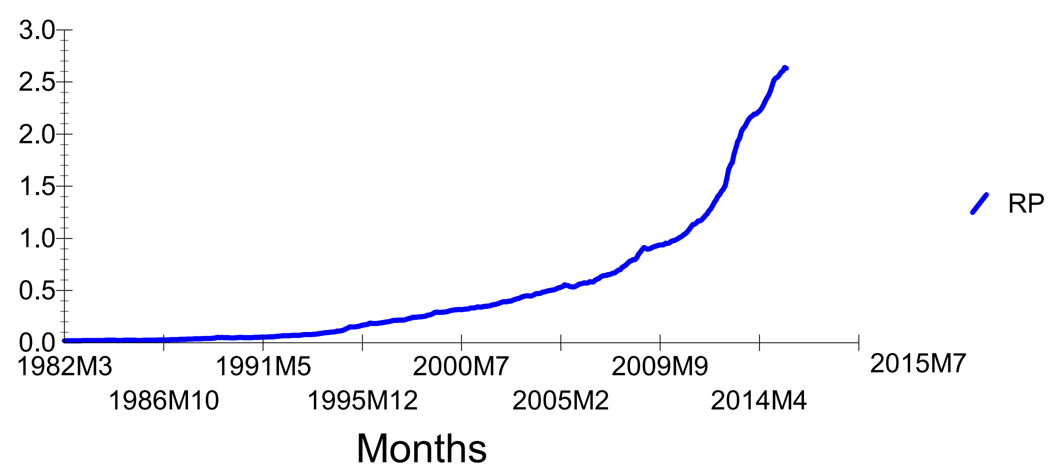


Table 1: The Result of ADF Test Applied to Level and First-Differenced Variables

	LnEX	*ΔLnEX*	*LnRP*	*ΔLnRP*
DF	-.99081	-16.74	0.7798	-13.27
ADF(1)	-.98318	-14.08	0.3936	-10.13
ADF(2)	-.97886	-10.11	0.3543	-8.304
ADF(3)	-.98864	-9.062	0.2987	-8.032
ADF(4)	-.98646	-8.551	0.3291	-8.256
ADF(5)	-.97627	-8.085	0.3940	-7.662
ADF(6)	-.96496	-7.450	0.4013	-6.632
ADF(7)	-.96674	-7.005	0.3608	-6.026
ADF(8)	-.98151	-7.061	0.3341	-5.745
ADF(9)	-.94171	-6.617	0.3262	-4.942
ADF(10)	-.95103	-5.354	0.2445	-4.002
ADF(11)	-1.0705	-5.525	0.1091	-3.147
ADF(12)	-1.0201	-4.834	-0.0388	-3.101

95% critical value for the augmented Dickey-Fuller statistic = -2.8692

REFERENCES

Bahmani-Oskooee, M. (1993), "Black Market Exchange Rates vs. Official Exchange Rates in Testing PPP: An Examination of the Iranian Rial," *Applied Economics*, Vol. 25, pp. 465-472.

Bahmani-Oskooee, M. (2005), "History of the Rial and Foreign Exchange Policy in Iran", *Iranian Economic Review,* Vol. 10, pp. 1-20.

Bahmani-Oskooee, Mohsen and Gour G. Goswami (2005b), "Black Market Exchange Rates and Purchasing Power Parity in Emerging Economies," *Emerging Markets Finance and Trade* 41(3), 37-52.

Bahmani-Oskooee, M. and A. Tanku (2008), "The Black Market Exchange Rate vs. the Official Rate in Testing PPP: Which Rate Fosters the Adjustment Process", *Economics Letters,* pp. 40-43.

Bahmani-Oskooee, M. and S. Hegerty, (2010), "Purchasing Power Parity in Less-Developed and Transition Economies: A Review Article", *Journal of Economic Surveys*, Vol. 23 (2009), pp. 617-658.

Chortareas, G and Kapetanios, G., 2004. "The Yen Real Exchange Rate may be Stationary after all: Evidence from Non-linear Unit-root Tests", *Oxford Bulletin of Economics and Statistics*, Vol. 66, Issue 1, pp. 113-131.

Coe, Patrick J. and Apostolos Serletis (2002), "Bounds Tests of the Theory of Purchasing Power
Parity," *Journal of Banking and Finance* 26(1), 179-99.

Engle, R.F. and C.W.J. Granger (1987), "Co-integration and Error-Correction: Representation,
Estimation and Testing," *Econometrica* 55, 1251-1276.

El-Sakka, M. I. T. and R. McNabb (1994), "Cointegration and Efficiency of the Black Market for Foreign Exchange: A PPP Test for Egypt," *Economic Notes* 23(3), 473-80.

Kargbo, Joseph M. (2003a), "Cointegration Tests of Purchasing Power Parity in Africa," *World Development* 31(10), 1673-85.

Pesaran, M. H., Y. Shin, and R. J. Smith. 2001. "Bound Testing Approaches to the Analysis of Level Relationship," *Journal of Applied Econometrics*, 16, 289-326.

Phylaktis, Kate and Yiannis Kassimatis (1994), "Does the Real Exchange Rate Follow a Random Walk? The Pacific Basin Perspective," *Journal of International Money and Finance* 13(4), 476-95.

Sanchez-Fung, Jose R. (1999), "Efficiency of the Black Market for Foreign Exchange and PPP: The Case of the Dominican Republic," *Applied Economics Letters* 6(3), 173-76.