

Original Paper

Uncovered Interest Parity and Expected Depreciation in a Dollarized Cambodian Economy

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Abstract

This paper tests the Uncovered Interest Parity (UIP) for Cambodian economy using the Generalized Methods of Moment (GMM). GMM method is used to address the weak result of simple OLS method, including the problems of endogeneity, serial correlation, heteroskedasticity. The result showed that, during the period of exchange rate stability, UIP is not valid even the country is a very highly dollarized economy and people can save in both local currency and USD in domestic banks. The UIP coefficient is negative and significant for three-month and six-month interest rates. The negative coefficient suggests that the monetary policy that tries to decrease interest rate (increase) may face the risk of currency depreciation (appreciation). If local currency depreciation is the driving force of dollarization, reducing local interest rate will encourage more dollarization in the economy.

Keywords

uncovered interest parity, generalized methods of moment, dollarization

1. Introduction

Banks and deposit taking microfinance institutions (MFIs) in a highly dollarized Cambodian economy have allowed depositors to open bank accounts denominated in U.S. dollar (USD) and Khmer Riel (KHR). Dollarization in Cambodia has increased along with the rapid growth of the financial sector over the past years to become the highest dollarized economy in the Asian region. The degree of dollarization which is commonly measured as the ratio of Foreign Currency Deposits (FCDs) to broad money (M2) increased from 0.36 in December 1993 to 0.83 in August 2014 (Monetary Survey of the National Bank of Cambodia (NBC), 2017). Cambodian financial sector grew rapidly over the past years as reflected by the continued increase in the number of financial institutions, outstanding loan portfolios and coverage areas. The number of commercial banks, specialized banks and MFIs increased more than twofold in less than 10 years. The number of commercial banks increased from 15 in 2005

to 35 in 2014, specialize banks from four to nine, and registered MFIs from 16 to 38 for the same period. In 2017, Cambodian financial system consisted of 39 commercial banks (12 foreign branch banks, 12 locally incorporated banks, and 15 subsidiary banks), 15 specialized banks (1 state-owned bank), seven MDIs, 69 MFIs, 313 rural credit institutions, 11 leasing companies, 15 third-party processors, one credit bureau Cambodia, six representative offices, and 2,476 money changers (NBC, Annual report 2017).

As many low income countries in the World, Cambodia had a domestic saving that was not enough to cover domestic investment and the country experienced trade deficit and positive net inflow of foreign direct investment of about 10% of GDP in 2017. Some capital flows into financial sector in the form of equity investment and loans to fill shortage in domestic saving. As of September 2014, domestic banks borrowed in total USD 1008 million, of which 93% from abroad and the remaining 7% from within the country. Financial deepening still continued. Credit-to-GDP ratio of banks and microfinance institutions rose to an all-time high of 73% (and 20%) at the end of June 2018, up from 31.4% (and 3.8%) in 2010. Private sector deposits, which were largely in U.S. dollars, grew at 22.4% (year-on-year) in June 2018 (World Bank, 2018).

Financial institutions in Cambodia overwhelmingly borrowed funds from abroad to finance loans in domestic market. Those institutions can avoid exchange rate risk because they can provide loans in currency in which they borrow, which is generally in U.S. dollar. In 2017, of the total credit (loans) of USD 16.127 billion, 94% was in USD, 5% in KHR and the remaining 1% in Thai Baht (Credit Bureau of Cambodia's Annual Report, 2017). The dollarization is believed to be persistent because the degree of dollarization is increasing while the economy achieved high growth rate, stable exchange rate and inflation rate. Cambodian economy grew at an annual average of 7.7% for two decades over the 1994-2013 periods. Cambodian economy maintained a fairly constant growth over the period except in 2009 when the global financial crisis happened, the growth rate decreased to 0.1%. The World Bank in 2014 considered Cambodia part of the selected group of "Olympians of growth". In the World Bank's classification of countries by income group, Cambodia moved from a low-income economy to a lower-middle income country in 2015 as Cambodia Gross National Income (GNI) per capita reached USD 1,070, which was above the required threshold of USD1,026.

Annual average inflation remained low, hovering around 3.7% for the 2000-2015 periods. Over the same 2000-2015 periods, the annual average exchange rate was stable at around KHR 4,038 per USD after a large depreciation which occurred from May 1997 to May 1998 during the Asian financial crisis. The current exchange rate system for Cambodian economy is a managed floating regime under which the National Bank of Cambodia (NBC) intervenes in the exchange market through buying or selling USD to maintain a stable exchange rate. Over the study period from December 2006 to June 2018, the nominal exchange rate was stable moving slightly around KHR 4,000 per U.S. dollar.

Large domestic currency depreciation during the transition periods in late 1980s and early 1990s was the main economic factor behind dollarization in the country. Ra (2008) finds that there are positive effects (expected) of the expected rate of depreciation in market exchange rates on the holdings of US dollars in Cambodia. There were two stream of literatures about the effects of dollarization. On the one hand, dollarization seems to be good for Cambodia. Duma (2011) and Menon (2008) argued that, in a stable macroeconomic environment, dollarization in Cambodia was caused by “good news” rather than “bad news” factors. Those pieces of good news include a strong inward flow of dollars related to garments sector exports, tourism receipts, foreign direct investment, and aid. On the other hand, dollarization provided negative effects to Cambodian economy. Lay et al. (2012) find that dollarization in Cambodia induce domestic currency depreciation and intensifies exchange rate volatility. Kang (2005) conclude that the costs of dollarization in Cambodia, which include loss of siegiorage, some monetary, fiscal and foreign trade policies and worsening the distortion of income distribution, outweigh the benefits, which include stabilization of price levels and reduction in the risk of national default during a foreign currency crisis. Dollarisation can stabilize prices in Cambodia at the expense of competitiveness. Samreth et al. (2019) find that a positive US interest rate shock dampens trade balance of Cambodia with the EU through appreciation of the US dollar and the shock also leads to significant decrease in Cambodia’s international reserve level. Those literatures overlooked the relationship between interest rate differential and nominal exchange rate. There has been no research on this relationship despite interest rates are crucial for Cambodian borrowers.

This paper tests the Uncovered Interest Parity (UIP) for Cambodian economy using General Methods of Moment (GMM). The result shows that the UIP is not valid even the country is a very highly dollarized economy and people can save in both local currency and USD in domestic banks in the environment of stable exchange rate. The GMM method shows that the UIP coefficient is negative and significant for 3-month and 6-month interest rates. Usually, risk premium includes a country risk. However, in our research, both KHR and USD interest rates are taken from Cambodian banks. Thus, bank-specific credit risks are also likely taken out. Then, the remaining risk should be exchange rate volatility.

Section 2 provides an overview of the Uncovered Interest Parity (UIP) and covered interest parity and empirical method for testing the UIP. Section 3 shows the results of our empirical analysis. Section 4 provides conclusions.

2. Uncovered Interest Parity and Covered Interest Parity

Forward rate and the gap between domestic and foreign interest rates are theoretically two key predictors of exchange rate change. Uncovered interest rate parity (UIP) predicts that currency offering high interest rate will depreciate against currency offering low interest rate if the current spot rate is assumed to be constant. The UIP implies that the difference in interest rates is an estimate of the

future exchange rate change. The UIP plays an important role in building macroeconomic models. However, the theory has been rejected statically for most of the time for many currency pairs. The term “UIP puzzle or the forward-premium puzzle” refers to the invalidity of the UIP and opposite results. In contrast to the results predicted by the UIP, currencies of countries with high interest rates tended to appreciate rather than depreciate, in particular, during the floating exchange rate regime in the early 1970s.

A number of empirical studies suggested that there was no connection between interest rate differential and exchange rate depreciation. Froot and Taylor (1990) surveyed testes of unbiasedness hypothesis of the UIP by examining the coefficients on interest rate differential from regressing the change in the exchange rate on the interest differential. They found that the coefficient was less than one and most often turned negative. The average coefficients of 75 published estimates were -0.88. Flood and Taylor (1997) also found that there was no empirical connection between interest rates and the exchange rates as suggested by uncovered interest parity.

However, recent literature showed that the UIP can be valid in the long time horizon. Lothian and Wu (2011), using long time series that span two centuries, found that the regression slopes was positive for franc-sterling currency pairs and the slope estimate is significantly equal to one. Olmo and Pilbeam (2011) argued that the traditional approach to testing the UIP was misleading because there was a significant difference in volatility between the change in the log of exchange rates and the forward premium and the presence of conditional heteroskedasticity in the data.

The forward exchange rate also has no power to predict future spot rate. Empirical studies found that the coefficient on forward-spot differential from regressing the change in the exchange rate on the forward-spot differential was significantly negative. Forward discount, which is the percentage difference between the current forward and spot exchange rates, is often used to replace the interest rate differential to test the UIP. The forward rate is today’s dollar price of foreign exchange to be delivered on a specific date in the future. By arbitrage, the forward discount must equal the interest differential. The forward rate unbiasedness hypothesis implies that the forward rate is an unbiased predictor of the corresponding expected future spot rate under the assumption of risk neutrality and rational expectations. However, Fama (1984) concluded that there is a general consensus that forward exchange rates have little if any power as forecasts of future spot exchange rates.

Let suppose the forward exchange rate $F_{t,t+k}$ observed at time t for an exchange at $t+k$. k is the market determined certainty equivalent of the future spot exchange rate S_{t+k} . Fama (1984) expressed this certainty equivalent as the sum between an expected future spot rate and a premium, $f_{t,t+k} = E(s_{t+k}) + p_t$ where $f_t = \ln(F_t)$, $s_t = \ln(S_t)$. From this equation the different between the forward rate and the current spot rate is $f_{t,t+k} - s_t = E(s_{t+k} - s_t) + p_t$. Fama (1984) used the following regression equation to test whether the current forward-spot differential, $f_{t,t+k} - s_t$, can predict the future change in the spot rate, $s_{t+k} - s_t$.

$$s_{t+k} - s_t = a_k + b_k(f_{t,t+k} - s_t) + u_{t+k} \quad (1)$$

The forward rate unbiasedness hypothesis is the testing of the null hypothesis: $a_k = 0, b_k = 1$ and u_{t+k} to be serially uncorrelated. Empirical results typically showed that $b_k = 1$, the coefficient on the forward premium is significantly negative. Thus the forward exchange rates were not an unbiased predictor of future spot rates. This failure of forward rate to predict future spot rate is well known as the forward premium puzzle.

In the presence of uncertainty, the Uncovered Interest Parity (UIP) condition is given as follow:

$$E(S_{t+k}) = \frac{1 + i_t}{1 + i_t^*} S_t \quad (2)$$

By taking logs on both sides of the UIP equation, it can be approximated by the following equation.

$$i_t - i_t^* = E_t s_{t+k} - s_t \quad (3)$$

In perfect foresight equilibrium, $E_t s_{t+k} = s_{t+k}$, the nominal interest rate differential is equal to the actual change in the exchange rate.

$$i_t - i_t^* = s_{t+k} - s_t \quad (4)$$

where s_{t+k} is the natural logarithm of the spot U.S. dollar price in terms of the Khmer riel (KHR) over k -period and $i_t - i_t^*$ is the current k -period KHR interest rate less the k -period U.S. interest rate. From this equation, if Cambodian economy has a higher nominal interest rate in equilibrium, its currency must be expected to depreciate if the current exchange rate is fixed. Under rational expectations, we can write the actual exchange rate at $t + k$ as equal to the expectation of the future exchange rate plus a forecast error ζ_t (mean zero) uncorrelated with

$E_t s_{t+k}$, $s_{t+k} = E_t s_{t+k} + \zeta_{t+k}$. Hence, equation (3) can be written as:

$$s_{t+k} - s_t = i_t - i_t^* + \zeta_{t+k} \quad (5)$$

The ex-post observed change in the exchange rate between time t and $t + k$ is equal to the interest rate differential at time t plus a random forecast error with mean zero. Since the forecast error will be uncorrelated with information such as interest rate that is known at time t , we can recast uncovered interest parity in the form:

$$s_{t+k} - s_t = \alpha + \beta(i_t - i_t^*) + \zeta_{t+k} \quad (6)$$

The null hypothesis of uncovered interest parity is $\beta = 1$ (some also $\alpha = 0$ and $\beta = 1$) (Carl E. Walsh Second edition, Froot & Thaler, 1990).

The uncovered interest parity regression and the Fama regression are equivalent when we assume that the Covered Interest Parity (CIP) condition holds. The CIP condition is given as follow:

$$F_{t,t+k} = \frac{1+i_t}{1+i_t^*} S_t \quad (7)$$

By taking log on both sides of equation (7), the CIP can be approximated by the following equation.

$$f_{t,t+k} - s_t = i_t - i_t^* \quad (8)$$

Under the assumption that CIP holds, by plugging equation (8) into equation (6), we have:

$$s_{t+k} - s_t = \alpha + \beta(f_{t,t+k} - s_t) + \xi_{t+k} \quad (9)$$

The unbiasedness of forward exchange rates and the uncovered interest parity have similar role to play as predictors of future spot rates because the uncovered interest parity regression and the Fama regression are equivalent. However, McCallum (1994) argued that the Uncovered Interest Parity (UIP) relationship is more important than the unbiasedness of forward exchange rates in predicting future spot rates. The rejection of unbiasedness hypothesis is not necessarily the rejection of UIP hypothesis. The subsequent results use equation (6) for testing the UIP hypothesis for Cambodian economy.

Table 1 shows the descriptive statistics of interest rates in Commercial banks in Cambodia at different maturity. Those commercial banks in the country accept deposit and provide loans in both KHR and USD. The monthly data of interest rates as well as exchange rate are taken from the National Bank of Cambodia. On the deposit side, the monthly average interest rate on deposit in KHR is higher than in USD for all maturity. Over the period from December 2006 to June 2018, the annual average interest rate on 12-month deposit in KHR is 6.51 % while it is 4.69% in USD. On the loan side, the monthly average interest rate on loans in KHR is higher than in USD for all maturity. Over the period from December 2006 to June 2018, the annual average interest rate on 12-month loan in KHR is 18.13% while it is 13.68% in USD.

Table 1. Description of Deposit Rate and Loan Rate for U.S. Dollar and Khmer Riel over 2006M12-2018M06 (in %)

Terms	Deposit rate (%) (2006M12-2018M06)							
	12 months	in Khmer riel (KHR)			in U.S. dollar (USD)			
		6 months	3 months	1 months	12 months	6 months	3 months	1 months
Mean	6.51	5.44	4.45	3.20	4.69	3.74	2.85	2.11
Median	6.52	5.44	4.44	2.99	4.44	3.42	2.44	1.73
Maximum	7.70	6.50	5.72	5.58	6.38	5.59	4.81	3.95
Minimum	5.80	4.67	3.87	2.09	4.23	3.23	2.23	1.46
Std. Dev.	0.53	0.51	0.37	0.77	0.55	0.64	0.74	0.71
Skewness	0.59	0.40	0.45	0.98	1.88	1.59	1.26	1.22

Kurtosis	2.63	2.29	2.74	2.91	5.53	4.50	3.32	3.16
Jarque-Bera	8.85	6.56	5.01	22.09	118.83	71.88	37.49	34.74
Probability	0.01	0.04	0.08	0.00	0.00	0.00	0.00	0.00
Sum	905.19	756.57	618.42	444.72	651.76	520.09	396.70	293.23
Sum Sq. Dev.	38.71	36.09	19.03	82.55	41.91	56.69	75.23	69.02
Observations	139.00	139.00	139.00	139.00	139.00	139.00	139.00	139.00
Loan rate (%) (2006M12-2018M06)								
		in Khmer riel (KHR)				in U.S. dollar (USD)		
Terms	12 months	6 months	3 months	1 months	12 months	6 months	3 months	1 months
Mean	18.13	18.37	18.02	18.71	13.68	14.28	13.89	14.41
Median	17.33	19.09	18.00	18.80	11.98	13.00	12.48	12.85
Maximum	23.19	23.04	23.02	23.04	17.15	18.96	18.95	19.48
Minimum	11.39	9.29	8.10	11.27	11.12	10.37	9.30	9.83
Std. Dev.	4.08	3.72	3.77	3.37	2.25	2.43	2.77	2.66
Skewness	-0.12	-0.88	-0.77	-0.85	0.23	0.20	0.14	0.26
Kurtosis	1.60	2.86	2.95	3.13	1.18	1.42	1.42	1.49
Jarque-Bera	11.73	17.92	13.59	16.89	20.44	15.38	14.85	14.87
Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum	2520.49	2553.93	2504.49	2600.73	1901.76	1985.61	1931.05	2003.47
Sum Sq. Dev.	2291.87	1909.94	1958.73	1563.65	699.33	813.90	1061.84	973.34
Observations	139.00	139.00	139.00	139.00	139.00	139.00	139.00	139.00

On average, interest rate on loan and deposit in KHR are higher than in USD, respectively. However, the interest rate on loan in KHR is the most volatile of all interest rates. Recently, the National Bank of Cambodia reduced lending rate on KHR to a level lower than lending rate on USD but the gap between deposit rates remained stable over time as shown in Figure 1.

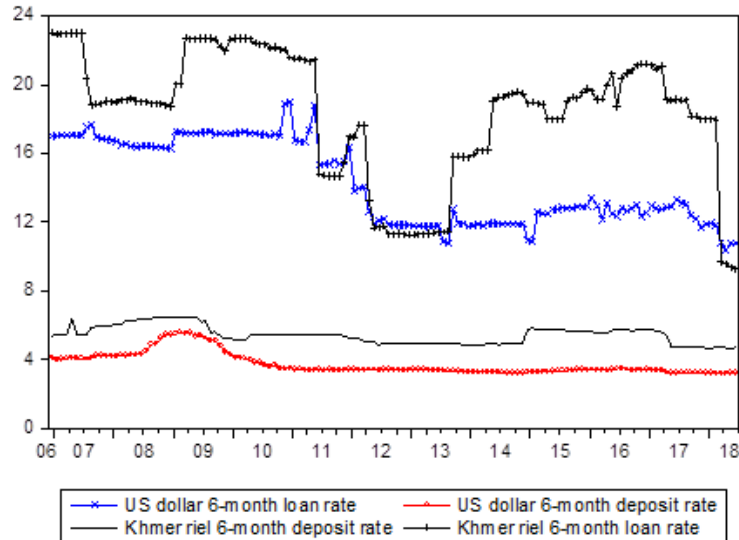


Figure 1. Six-month Loan Rate and Deposit Rate for U.S. Dollar and Khmer Riel over 2006M12-2018M06 (in %)

3. The Results

The augmented Dickey-Fuller (ADF) test of exchange rate change and interest rate differentials is shown in Table 2. Exchange rate changes are classified into four categories: one-month change, three-month change, six-month change and 12-month change. Difference in deposit rate is equal to deposit rate for KHR minus the deposit rate for USD. Interest rate differentials are also classified into four categories based on maturity of deposit: one-month, 3-month, 6-month and 12-month deposit rates. Akaike Information Criterion (AIC) is used for selecting lag length. P-value and lag length are in parentheses.

The ADF test use equation $\Delta Y_t = \mu + \gamma Y_{t-1} + \sum_{j=1}^p \alpha_j \Delta Y_{t-j} + \beta t + \omega_t$. The null hypothesis is that the series has a unit root for ADF test is $H_0: \gamma = 0$, and the alternative hypothesis is $H_a: \gamma < 0$. Column 2 and column 3 of Table 2 show the ADF test with intercept only and with both intercept and trend, respectively.

Each exchange rate change is stationary when the ADF regression includes only intercept. However, the one-month and six-month exchange rate change becomes non-stationary when we add both intercept and trend in the regression. Interest rate differentials are non-stationary.

The results of testing UIP by running regression equation (6) for each maturity of interest rate are shown in Table 3. The coefficients on interest rate differentials as shown in column 3 of Table 3 are negative and insignificant for all different maturity of interest rates. However, we suspect that the variance of error term in regression equation (6) might not be constant, the error term might be serially

correlated, and the regressor $i_t - i_t^*$ might be endogenous.

Column 4 of Table 3 shows the White heteroskedasticity test which is the test of the null hypothesis of no heteroskedasticity (H_0) against alternative hypothesis of heteroskedasticity. No heteroskedasticity for one-month, three-month and 12-month UIP equations cannot be rejected.

Table 2. ADF Test for Unit Root

	Exchange rate change	
	intercept	intercept and trend
1 month ($S_{t+1}-S_t$)	-3.002(11) (0.037)	-3.042(11) (0.125)
3 month ($S_{t+3}-S_t$)	-2.913(9) (0.046)	-2.953(9) (0.149)
6 month ($S_{t+6}-S_t$)	-3.234(11) (0.020)	-3.253(11) (0.079)
12 month ($S_{t+12}-S_t$)	-1.788(12) (0.020)	-1.724(12) (0.079)
	Interest rate differentials	
1-month maturity	-1.982(2) (0.294)	-2.012(2) (0.589)
3-month maturity	-1.625(3) (0.466)	-2.554(4) (0.301)
6- month maturity	-2.402(0) (0.143)	-2.371(0) (0.392)
12-month maturity	-2.997(0) (0.143)	-2.964(0) (0.392)

Note. p-value and lag length are in parentheses.

Table 3. Results of Regression Equation (6)

Maturity	α	β	R ²	White test	Serial Correlation LM
1-month deposit	0.002 (0.331)	-0.157 (0.307)	0.008	0.059 (0.942)	3.668 (0.028)
3-month deposit	0.005 (0.104)	-0.319 (0.076)	0.023	0.773 (0.405)	103.112 (0.000)
6-month deposit	0.008 (0.2078)	-0.494 (0.1721)	0.014	3.186 (0.0446)	158.316 (0.000)
12-month deposit	0.005 (0.442)	-0.311 (0.388)	0.006	1.902 (0.1536)	260.720 (0.000)

Note. p value are in parentheses.

Breusch-Godfrey Serial Correlation LM Test of null hypothesis of no serial correlation (H_0) was rejected for each of the four maturity types. It is also suspected that the regressor $i_t - i_t^*$ might be endogenous. Let regress $i_t - i_t^*$ on reserve requirement rate, one-year U.S. T-bill rate and dummy for financial crisis in 2008 and 2009. These variables can be related with regressor $i_t - i_t^*$ but may have no correlation with the error terms. The reserve requirement rate is for deposit in U.S. dollar in the banking system in Cambodia. We do not use the reserve requirement for deposit in Khmer riel because it was kept constant at 8% over the study period. The National Bank of Cambodia changed the reserve requirement rate for U.S. dollar deposit to counter economic fluctuation. The one-year U.S. T-bill rate is the monthly 1-Year Treasury Constant Maturity Rate taken from Federal Reserve Bank of St. Louis. The dummy for financial crisis takes the value of 1 for the period from 2008M04 to 2010M03 and zero otherwise.

Then we use the residual from this regression to do Hausman test. First I run the following equation:

$$i_t - i_t^* = \beta_0 + \beta_1 \text{crisis_d} + \beta_2 \text{one_yearT} + \beta_3 \text{reser} + v_t \quad (10)$$

And then residual for the equation is saved for running the following equation:

$$s_{t+k} - s_t = \alpha + \beta(i_t - i_t^*) + \lambda v_t + \xi_{t+k} \quad (11)$$

The null hypothesis that the interest rate differential is exogenous or no endogeneity is $H_0: \lambda = 0$.

Table 4. Endogenous Regression Result of Regression Equation (10)

variable	1 month		3 months		6 months		12 months	
	coeffs	P-value	coeffs	P-value	coeffs	P-value	coeffs	P-value
c	0.014	0.000	0.006	0.033	0.015	0.000	0.018	0.000
crisis_dummy	-0.004	0.000	-0.014	0.000	-0.007	0.000	-0.004	0.000
one-year T-bill	0.123	0.000	-0.048	0.093	-0.020	0.520	0.007	0.808
reserve	-0.033	0.079	0.107	0.000	0.030	0.215	0.009	0.691
R ²	0.490		0.729		0.379		0.169	

The result of regression equation (10) is shown in Table 4. We observed that most of the coefficients in regression equation (10) are significant, in particular, when one-month and three-month interest rate differentials are used as dependent variables in regression equation (10). In column 4 of Table 4, the coefficients on crisis dummy and one-year T-bill are negative. Financial crisis which occurred from 2008 to 2009 and the increase in one-year T-bill tend to decrease the difference of three-month term deposit rates. However, the increase in reserve requirement tends to increase the interest rate differential. Column 2 of Table 4 shows that the coefficient on one-year T-bill is significantly positive and the coefficient on reserve requirement is significantly negative when we use difference of one-month term deposits as dependent variables.

The result of regression equation (11) is shown in Table 5. Exogeneity of interest rate differential H_0 is accepted for one-month and three-month but not for six-month and 12-month interest rate differentials. This means that six-month and 12-month interest rate differentials are endogenous.

Table 5. Testing Endogeneity of Regression Equation (11)

	1 month		3 months		6 months		12 months	
	Coeffs	P-value	Coeffs	P-value	Coeffs	P-value	Coeffs	P-value
α	0.002	0.415	0.008	0.034	0.027	0.007	0.038	0.014
β	-0.182	0.405	-0.477	0.024	-1.628	0.005	-2.149	0.013
λ	0.051	0.870	0.582	0.151	1.858	0.013	2.277	0.019
R ²	0.008		0.038		0.060		0.049	

Figure 2 shows the cumulative sum (CUSUM) test of stability of parameters.

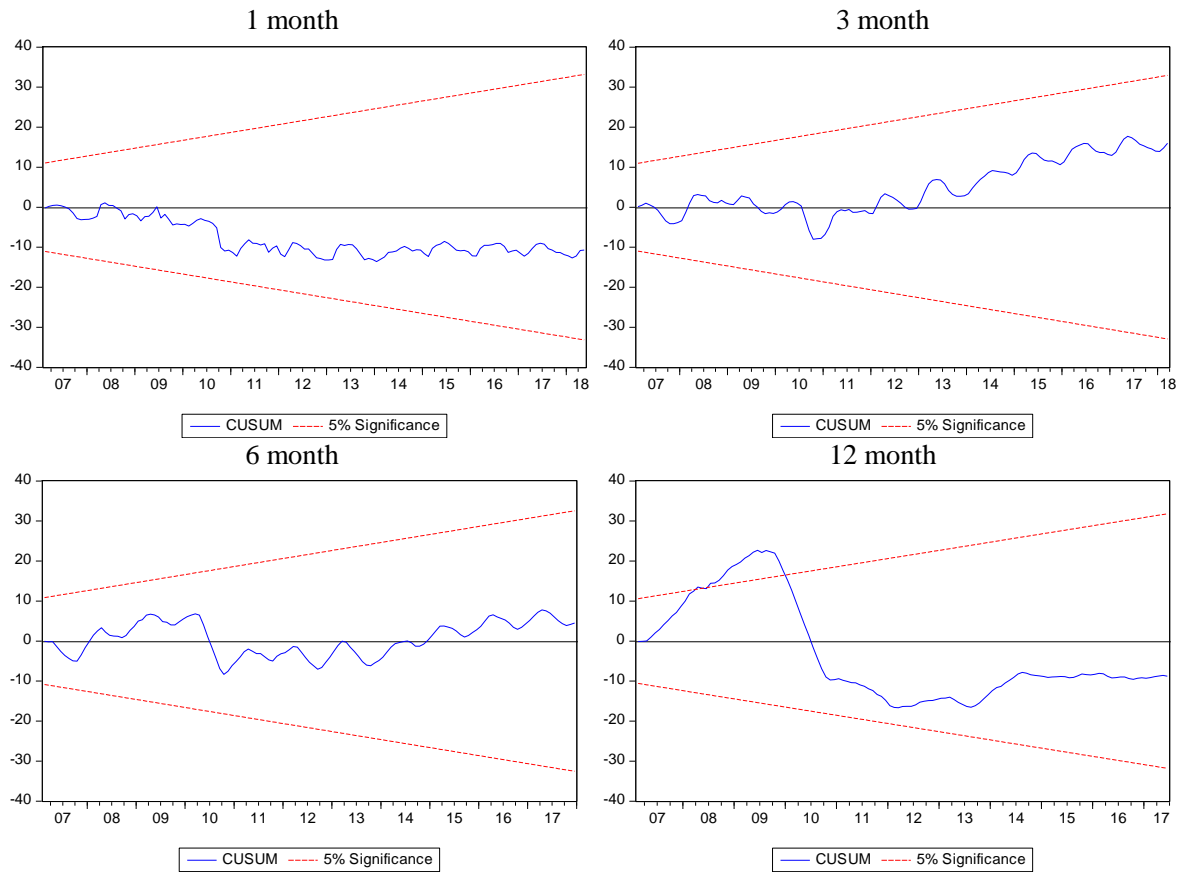


Figure 2. CUSUM Test

The cumulative sum (CUSUM) test of stability of parameters suggests that parameters for one-month, three-month and six-month interest rates are stable except for 12-month interest rate differentials as shown in Figure 2. The test finds parameter instability if the cumulative sum goes outside the area between the two critical lines. We observed heterogeneity, serial correlation, endogeneity problems in the UIP regression. Therefore to improve the regression results in Table 3, we again estimate the Generalized Method of Moment (GMM) model with a Newey-West Heteroscedasticity and Autocorrelation Consistent (HAC) variance-covariance matrix. Using instrumental variables: reserve requirement rate, one-year T-bill rate and dummy for financial crisis in 2008 and 2009, the GMM result is shown in Table 6. The coefficients are negative and significant for three-month and six-month interest rates. Although the banks in Cambodia accepted deposits in both U.S dollar and Cambodian riel and the exchange rate has been stable, UIP is still not valid. The larger the interest rate differential, the more exchange rate will appreciate.

Table 6. Results of Testing UIP Using GMM in Regression Equation (6)

Maturity	α	β	R^2	95% CI for β	
				Low	High
1-month deposit	0.002 (0.240)	-0.173 (0.239)	0.008	-0.461	0.116
3-month deposit	0.007 (0.052)	-0.453 (0.055)	0.017	-0.917	0.011
6-month deposit	0.025 (0.016)	-1.549 (0.023)	-0.053	-2.881	-0.217
12-month deposit	0.028 (0.484)	-1.578 (0.451)	-0.094	-5.711	2.555

Note. p-values are in parentheses.

4. Conclusions

The result showed that UIP is not valid even the country is a very highly dollarized economy and people can save in both local currency and USD in domestic banks in the environment of stable exchange rate. The GMM method shows that the UIP coefficient is negative and significant for 3-month and 6-month interest rates. This result is in contradiction to the general belief that in a highly dollarized and stable exchange rate environment, the UPI should hold. This result implies that if the monetary authority sets interest rate on local currency deposit to be much higher (lower) than the interest rate on USD deposit, the exchange rate will be appreciating(depreciating), for example though setting interest rate on Negotiable Certificate of Deposit (NCD). The appreciation in local currency may encourage people to hold more local currency. However, increasing interest rate on local currency may discourage people to borrow funds in local currency and consequently the demand for local currency may fall. Monetary policy that changes interest rate on local currency faces trade-off between currency appreciation and demand for local currency. If the Central bank use a policy that lower interest rate too much, local currency may face the risk of large depreciation and dollarization will continue to increase. Usually, risk premium includes a country risk. However, in our research, both KHR and USD interest rates are taken from Cambodian banks. Thus, bank-specific credit risks are also likely taken out. Then, the remaining risk should be exchange rate volatility.

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