The Relationship between Foreign Interest Rate and Domestic Interest Rates in the MENA Region: An Interest Rate Parity Approach

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Abstract:

The main concern of this research is to investigate the impact of foreign interest rate (i.e., US interest rate) on domestic interest rates in the MENA countries within the hypothesis of the Interest Rate Parity. A model was developed in such a way that; the domestic interest rates in the MENA countries were set as a direct function of the foreign interest rates (i.e., the US interest rate). Following the notion of the interest rate parity, the relationship between foreign interest rates and domestic interest rates was, in our model, controlled by the domestic exchange rates (in MENA countries) and real GDP as a proxy of macroeconomic aggregates. Panel data was employed in order to test for:

- Homogeneity among the sample countries by estimating Pooled OLS, Fixed Effect and Random Effect models.
- Short-run and long run effects by estimating a Pooled ARDL model.
- Impulse response by estimating a VAR model

The results show that the impact of the foreign interest rate on the domestic interest rates in the MENA countries varies among

countries, where US interest rate has had greater impact on small economies with pegged exchange rate regime (i.e., Gulf countries, Lebanon and Jordan) than economies with floating exchange rates (i.e., Algeria, Egypt, Turkey, Iran, Morocco and Tunisia).

Key words:

Interest rate parity - Domestic interest rate - Foreign interest rate - Fixed effect - Random effect-Exchange rate - Pooled OLS-Pooled ARDL - Impulse response.

العلاقة بين سعر الفائدة الأجنبي وأسعار الفائدة المحلية في منطقة الشرق الأوسط وشمال إفريقيا: وفقًا لفرضية تعادل أسعار الفائدة

الملخص :

الاهتمام الرئيسي لهذا البحث يتمثل في دراسة أثر سعر الفائدة الأجنبي (أي سعر الفائدة في الولايات المتحدة) على أسعار الفائدة المحلية في دول الشرق الأوسط وشمال إفريقيا(MENA) ، وذلك ضمن فرضية تعادل أسعار الفائدة. تم تطوير نموذج يتم فيه تحديد أسعار الفائدة المحلية في دول المنطقة كدالة مباشرة لأسعار الفائدة الأجنبية (أي سعر الفائدة الأمريكي).

وبالاستناد إلى فرضية تعادل أسعار الفائدة، تم في نموذجنا التحكم في العلاقة بين أسعار الفائدة الأجنبية وأسعار الفائدة المحلية من خلال أسعار الصرف المحلية (في دول الشرق الأوسط وشمال إفريقيا) والناتج المحلي الإجمالي الحقيقي كمؤشر للمتغيرات الكلية الاقتصادية.

تم استخدام بيانات بانل (Panel Data) لاختبار ما يلي:

- التجانس بين الدول المشمولة في العينة من خلال تقدير نماذج OLS المجمعة، والنموذج ذو التأثيرات الثابتة، والنموذج ذو التأثيرات العشوائية.
- الآثار قصيرة الأجل وطويلة الأجل من خلال تقدير نموذج ARDL المجمّع.

- الاستجابة للصدمات من خلال تقدير نموذجVAR

تُظهر النتائج أن تأثير سعر الفائدة الأجنبي على أسعار الفائدة المحلية في دول الشرق الأوسط وشمال إفريقيا يختلف من دولة لأخرى، حيث كان لسعر الفائدة الأمريكي تأثير أكبر على الاقتصادات الصغيرة ذات أنظمة سعر الصرف الثابت (مثل دول الخليج ولبنان والأردن) مقارنة بالاقتصادات التي تعتمد أنظمة سعر صرف عائمة (مثل الجزائر، مصر، تركيا، إيران، المغرب وتونس).

الكلمات المفتاحية

تعادل أسعار الفائدة – سعر الفائدة المحلي – سعر الفائدة الأجنبي التأثيرات الثابتة – التأثيرات العشوائية – سعر الصرف المجمّع ARDL – الاستجابة للصدمات

1. Introduction

When interest rate changes in one country; especially if being large and effective such as the United States, it would affect other countries in various ways; exerting significant influence over monetary policies across those countries. International interest rate transmission models typically highlight exchange rate channels, trade channels, and financial channels as critical factors influencing how foreign economies respond to changes in interest rates in another country. These three channels are fundamental components in various macroeconomic policy transmission models that integrate Keynesian pricing assumptions within the framework of Mundell-Fleming-Dornbusch.

The Fed's decision regarding interest rate is a powerful tool for influencing the U.S. and global economy. This decision has different impact on economic activity, inflation, and financial stability through different transmission channels. The main aspects of these international interest rate transmission channels are as follows:

Firstly; Interest rate differentials which drive capital flows across countries. Increased interest rate in one country tend to increase capital inflow seeking high returns. This can make the currency of the high interest rate appreciate and interest rate increases.

Secondly; Exchange rate channel; where changes in interest rates have noticeable impact on exchange rates. Increasing interest rate within a country would attract foreign capital which stimulate the appreciation of the currency. Conversely, reduced interest rates increases the exchange rate. Considering that fluctuations in exchange rate affects the trade balance and the export competitiveness of the economy. The exchange rate channel is based on the concept of demand substitution between domestically produced and foreign goods. It suggests that higher interest rates in the United States can lead to an expansion of economic activity abroad. For example, when interest rates increase in the U.S., the dollar appreciates. As a result, international demand shifts away from U.S. products and towards goods from other countries. Under flexible exchange rates, foreign economies should experience GDP

growth due to increased exports. However, a country that pegs its exchange rate to the U.S. dollar would face an appreciation that could lower its GDP.

Thirdly; the trade channel that operates on the premise that higher U.S. interest rate reduces income and expenditures there, leading to reduced demand for both domestically produced and imported goods. This, in turn, decreases economic activity and GDP in foreign countries. The strength of this channel depends on the extent of exports and imports in the economic activity, especially with respect to the United States.

The international interest rate transmission channels carry substantial implications for the harmonization of monetary policy pursuits across diverse central banks. Interest rate changes can transmit stress across borders, thus different countries need to work together to make sure their interest rate policies make sense for everyone as their decisions affect not only their own country but also the whole world. Noting that early identification of vulnerabilities can help policy makers take actions to prevent crises.

In this respect, this paper is an analyzing study to the impact of U.S. interest rate on the domestic interest rate in 13 MENA countries through the period 1999 – 2023, covering the effect of the exchange rate regime in this analysis.

2. Literature Review:

The relationship between the international interest rate, domestic interest rate and exchange rate is considered a

cornerstone of international finance, as it helps explain the underlying forces that drive exchange rate movements. It suggests that interest rate differentials between countries are not arbitrary but rather reflective of anticipated changes in the relative values of their currencies.

The concept of uncovered interest rate parity (UIP) holds profound implications for the field of international finance. It clarifies the dynamic interplay between exchange rates and domestic interest rates in the foreign exchange market. The UIP condition highlights the intimate connection between domestic interest rates and exchange rates. It demonstrates how the dynamics of one market (interest rates) is extremely connected to the dynamics of another market (foreign exchange), with significant implications for investors, policymakers, and market participants operating in the global financial system. From uncovered interest parity (UIP) condition, arbitrage occurs when the choice between domestic and international debt holdings balances. (Ali, Ahmad et.al, 2024)

$$E(e_{t+1} - e_t) = I_t - I_t^* + \omega_t \qquad (1)$$

Where; It and I*t, respectively, indicate the nominal interest rates of home and foreign countries, Eet + 1 is the expected exchange rate and ωt is the exchange risk premium.

UIP assumes that the difference in interest rates between two economies should theoretically be equal to the expected change in the exchange rate between their respective currencies. In other words, if the interest rate in one country is higher than the interest rate in another country, the currency of the country with the higher interest rate is expected to depreciate against the currency of the country with the lower interest rate, to the extent that any gains from the interest rate differential are offset. The interest rate parity theory is based on the key assumption of investor rationality. The theory asserts that when expected exchange rate changes are accounted for, the rate of return on investments in domestic and foreign assets will be equal. (Liu& Lee, 2022)

When the interest rate in one country is higher than the interest rate in another country, this will lead to an increase in the exchange rate between their currencies. Thus, it is expected that increasing the Fed's interest rate and the exchange rate would in turn increase the domestic interest rate for MENA countries and their expected coefficients' signs would be positive.

Regarding income; higher income is expected to result in higher transaction demand for money and in order to maintain equilibrium in the money market, money supply must increase. Higher money supply would push interest rate down and the expected coefficient sign would be negative. However, if the nation's monetary policy is a contractionary one, then the

domestic interest rate would increase and the expected coefficient sign would be positive.

Several papers have studied this relationship through examining the impact of the U.S. interest rate on several variables in many countries. Where; the most impactful papers are the following:

Reinhart and Reinhart (2001) consider a variety of North–South links when examining Group of Three (G-3) interest rate and exchange rate volatility, and find that the U.S. real interest rate affects growth in some regions. Frankel and Roubini (2001) also find a negative effect of G-7 real interest rates on less-developed countries' output.

A notable contribution is Kim (2001), who finds that U.S. interest rates have an impact on output in the other six G-7 countries. This paper examines the potential channels through which the interest rate has an effect. It finds virtually no trade impact and that the impact on output comes from a reduction in the world interest rate.

Ehrmann and Fratzscher (2005), found that domestic interest rates react to both external (US) and domestic (Singapore) monetary policy announcements. Also Di Giovanni, McCrary and von Wachter (2005) examine the causal impact of domestic monetary policy by instrumenting other European interest rates with the German one in order to test for the impact of domestic monetary policy, and find a strong effect.

Some empirical evidence documenting that international interest rate differential with the US tend to fall to a change in US interest rates (Uribe and Yue, 2006) and international interest rates co-move with US interest rates in the long-run regardless of the exchange rate regime in place (Frankel et al., 2004).

(Giovanni and Shambaugh, 2008) This paper explores the connection between interest rates in major industrial countries and annual real output growth in other countries. The results show that high foreign interest rates have a contractionary effect on annual real GDP growth in the domestic economy, but that this effect is centered on countries with fixed exchange rates. The paper then examines the potential channels through which major-country interest rates affect other economies. The effect of foreign interest rates on domestic interest rates is the most likely channel when compared with other possibilities, such as a trade effect.

(Valente 2009) This paper studies the responses of market interest rates to US monetary policy announcements for the US and two emerging economies, Hong Kong and Singapore which are similar on many respects but have experienced opposite exchange rate regimes in the last twenty years. The results show that FOMC announcements significantly affect the term structure of interest rate in the US and both Asian countries. Further, international interest rate differentials around FOMC meeting dates tend to be negative for short maturities. Regarding

Singapore, it was found that domestic interest rates react to both external and domestic monetary policy announcements with a larger magnitude

Rey (2015) and Miranda-Agrippino and Rey (2020) show that changes in interest rates in core countries can trigger a global financial cycle that, regardless of the exchange rate regime, may generate positive global spillovers.

(Navaro& Iacoviello, 2019) studies the spillover effect of U.S. interest rates on economic activity in a large panel of 50 advanced and emerging economies. In advanced economies, trade openness with the United States and the exchange rate regime account for a large portion of the contraction in activity. In emerging economies, the responses do not depend on the exchange rate regime or trade openness, but are larger when vulnerability is high.

(Arteta et.al. 2022) This paper examines the implications of different types of interest rate shocks in the United States for emerging market and developing economies (EMDEs). It documents that rising U.S. interest rates driven by reaction shocks are especially likely to push EMDEs into financial crisis.

3. Model and Data

Based on the concept of interest parity, as discussed in the previous section, and following the expectation of macroeconomic theory, the domestic interest rate R_D is expected

to depend on three main variables: domestic income Y, exchange rate ER and foreign interest rate R_{US}. Therefore,

$$R_D = f(Y, Er, R_{US}) \qquad (2)$$

Or

$$R_D = a + b_1 Y + b_2 ER + R_D + e \qquad (3)$$

Where e is an error term.

The estimation of this model is undertaken for 13 MENA countries over the period 1999 – 2023. This implies that data consists of time series of cross section, or panel data. Using panel data for such estimation of a sample of countries over time is thought to be relevant for 3 reasons:

1. To allow for group wise or regional analysis among MINA countries. This would help investigate if the impact of a foreign interest rate (here the US interest rate) differs because of different exchange rate regimes in different countries.
2. To investigate if country specific characteristics vary across the sample countries over time and, therefore, conclude if the impact of the foreign interest rate (i.e., the US interest rate) on the domestic interest rates (country specific interest rates) differs from a country group to another and why?
3. To allow for a larger sample size.

In this respect, three regression techniques for panel data analysis are applied to the following version of the model:

$$y_{it} = a + BX_{it} + e_{it} \qquad (4)$$

Where,

- $y_{it} = R_D$ is a vector of domestic interest rate in country i in year t.
- a is the constant
- X_{it} is a matrix of independent variables for country i in year t. These variables include domestic income Y, domestic exchange rate ER and foreign interest rate or US interest rate R_{US}.
- B is a vector of regression coefficients of the independent variables.
- e_{it} is a vector of the error term for country i in year t.

The three models to be estimated are:

i) **Pooled Ordinary Least Square (POLS)**, where it is assumed that all countries in the panel are more or less the same in terms of the intercept a (i.e., in terms of the impact of other variables) and coefficients (i.e., in terms of b_1, b_2 *and* b_3).

ii) **Fixed Effect model (FEM)**, where it is assumed that intercept (i.e., impact of other variables) of all countries is different due to different economic factors (e.g., investment, capital formation, country size, level of development, policy making, economic regime, political system …… etc.). in other words, due to

different country economic an no-economic characteristics.

iii) **Random Effect Model (REM)**, where it is assumed that the intercept of all sample countries is different due to randomness and not due to differences in country characteristics.

To select the appropriate technique or model, a number of steps are considered. In a first step a POLS model is run, followed by a Breusch-Pagan Test to investigate if the POLS is the appropriate technique. In other words, to conclude if there is no effect of cross section (i.e., countries) on the intercept. In the second step, a REM model is estimated, followed by a Hausman Test in order to conclude which model is appropriate: the REM model or the FEM model? The decision rule of the Hausman Test is as follows: if the significance level of the Test is greater than 5 percent, the FEM will be the appropriate model to apply to the data.

To estimate the above three models, data is collected for 13 MENA countries over the period 1999-2023. This gives a panel of 325 observations. The countries included in the sample are: Algeria, Egypt, Iran, Turkey, Tunisia, Morocco, Jordan, Bahrain, Kuwait, Qatar, Saudi Arabia, United Arab Emirates and Lebanon. The main source of data is World Bank.

4. Results

The results of estimating the three models for all 13 MENA countries are included in tables (1), (2) and (3).

Table (1): Pooled Ordinary Least Square POLS (All MENA Countries)*

Dependent variable: Domestic Interest Rate R_D (N = 325)

Variable	Coefficient	Standard error	$t-statitic$	Probability
C	-0.697840	1.021817	-0.682940	0.4951
Y	0.014276	0.001828	7.810233	0.0000
ER	0.000262	0.00000006	4.106046	0.0001
R_{US}	1.442695	0.272389	5.296457	0.0000

$R^2 = 0.25$ $F-statistice = 36.3$

*** All coefficients of explanatory variables (Y, ER and R_{US}) are significant at less than 1 percent significance level. However, the constant term is insignificant.**

Table (2): Random Effect REM (All MENA Countries)

Dependent variable: Domestic Interest Rate R_D (N = 325)

Variable	Coefficient	Standard error	$t-statitic$	Probability
C	5.470310	1.826081	2.995655	0.0030
Y	-0.012115	0.002859	-4.237665	0.0000
ER	0.000269	6.48E-05	4.147071	0.0000
R_{US}	1.104215	0.173779	6.354139	0.0000

$R^2 = 0.19$ $F-statistice = 24.8$

*** The constant term and a all coefficients of explanatory variables (Y, ER and R_{US}) are significant at less than 1 percent significance level.**

Table (3): Fixed Effect FEM (All MENA Countries)
Dependent variable: Domestic Interest Rate R_D (N = 325)

Variable	Coefficient	Standard error	$t-statitic$	Probability
C	6.644144	0.910210	7.299576	0.0000
Y	-0.017304	0.003086	-5.607392	0.0000
ER	0.000287	6.64E-05	4.325086	0.0000
R_{US}	1.041169	0.174337	5.972170	0.0000

*** All coefficients of explanatory variables (Y, ER and R_{US}) are significant at less than 1 percent significance level. However, the constant term is insignificant.**

The Pooled Ordinary Least Square POLS

The results in table (1) shows that higher income leads to higher domestic interest rate. This result seems to be irrelevant for MENA countries, which are developing countries. Based on economic theory (Polak and White, 1955), an increase in income in an open economy due to an increase in aggregate demand (consumption, investment or government expenditure) will force money supply to increase and, consequently, interest rate will decrease. This implies that the relationship between income and interest rate is negative. It follows that, the positive sign of the income coefficient in table (1) seems to be tricky and unexpected. Moreover, the results in table (1) shows that the constant term (a) is statistically insignificant. This implies that there might be now impact of other variables (other than income, exchange rate and US interest rate) on the domestic interest rate. This result seems to be unacceptable where country economic

and political characteristics are expected to have some significant impact on the domestic interest rate.

The Breusch-Pagan Test

To explore if the POLS is the appropriate technique, the Breusch-Pagan Test was performed. The results in table (4) show that for cross section, the value of the test is significant, while for time the value of the test is insignificant. This implies that the Pooled Ordinary Least Square is not the appropriate model and, therefore, either the Random Effect model REM or thee Fixed effect model FEM is the relevant model.

Table (4): Two-sided Breusch-Pagan Test (All MENA Countries)

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	848.0206	1.401456	849.4221
	(0.0000)	(0.2365)	(0.0000)
Honda	29.12079	-1.183831	
	(0.0000)	(0.8818)	(0.0000)
King-Wu	29.12079	-1.183831	23.09354
	(0.0000)	(0.8818)	(0.0000)
Standardized Honda	33.05686	-0.951873	17.40511
	(0.0000)	(0.8294)	(0.0000)
Standardized King-Wu	33.05686	-0.951873	21.57307
	(0.0000)	(0.8294)	(0.0000)

The Random Effect Model REM and the Fixed Effect model FEM

Table (2) presents the results of the Random Effect Model REM. The results are highly statistically significant and all coefficient have the correct sign. However, the Hausman test is performed in order to select the appropriate model, either the Random Effect Model REM or the Fixed Effect Model FEM. This distinction between the two models is essential in order to investigate if country-specific characteristics do matter or not.

The result of the Hausman test is included in table (5).

Table (5): Hausman Test (All MENA Countries)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	3	1.0000

* Cross-section test variance is invalid. Hausman statistic set to zero.

According to the Hausman test, the value of the chi-square is almost zero and insignificant and, consequently, the fixed effect is the most relevant. This implies that the constant term is not common among countries. In other words, the impact of the US interest rate, and other independent variables, on the domestic interest rate is not uniform across the sample MENA countries (Some of these countries have floating exchange rate while others follow the system of fixed exchange rate).

Therefore, the sample countries have been split into two groups according to exchange rate regime:

Group (1): countries with floating, or almost floating, exchange rate (Algeria, Egypt, Iran, Turkey, Tunisia and Morocco).

Group (2): countries with fixed (pegged) exchange rate (Jordan, Bahrain, Kuwait, Qatar, UAE and Lebanon).

The results of running the Random effect model for the two groups of countries are included in tables (6) and (7).

Table (6): Random Effect REM (Countries with floating exchange rate)*

Dependent variable: Domestic Interest Rate R_D (N = 150)

Variable	Coefficient	Standard error	$t-statitic$	Probability
C	5.970043	2.369858	2.519156	0.0128
Y	-0.005260	0.001235	-4.275306	0.0000
ER	0.000238	8.83E-05	2.697199	0.0078
R_{US}	1.596636	0.359670	4.439169	0.0000

$R^2 = 0.53$ $F-statistice = 78.20$

Hausman Test: Chi-Sq. Statistic = 39.44 (significant at the 1% level).

*** All coefficients of explanatory variables (Y, ER and R_{US}) are significant at less than 1 percent significance level.**

Table (7): Random Effect REM (Countries with fixed exchange rate regime)
Dependent variable: Domestic Interest Rate R_D (N = 175)

Variable	Coefficient	Standard error	$t-statitic$	Probability
C	0.555219	0.446629	1.243132	0.2155
Y	-0.000863	0.000112	-7.705357	0.0000
ER	0.003596	0.000575	6.250256	0.0000
R_{US}	0.886674	0.060458	14.66586	0.0000

$R^2 = 0.62$ $F-statistice = 91.9$

Hausman Test: Chi-Sq. Statistic = 26.76 (significant at the 1% level).

*** The constant term and all coefficients of explanatory variables (Y, ER and R_{US}) are significant at less than 1 percent significance level.**

Results in tables (6) and (7) reflect considerable improvements over those in tables (1), (2) and (3). This indicates that the differences among countries in the same group are attributed to randomness. As theoretically expected, for both group of countries income Y has a significant negative impact on the domestic interest rater_D, while exchange rate ER has a significant positive impact and US interest rate RUS has a significant positive impact.

Long-Run Effect

To test for the long-run impact of the USA interest rate on the domestic interest rate in the two groups of countries, a Panel ARDL (Panel Autoregressive Distributed Lag) model is estimated. The results are presented in tables 8 and 9.

Table (8): Panel ARDL (Countries with floating exchange rate regime)

Dependent variable: Domestic Interest Rate R_D (N = 150)

Variable	Coefficient	Standard error	$t-statitic$	Probability
		Long-Run		
RUS	0.458524	0.186601	2.457246	0.0154
		Short-Run		
COINTEQ01	-0.226168	0.050107	-4.513713	0.0000
C	1.669280	0.618989	2.696785	0.0080
D(RUS)	1.267497	0.404511	3.133346	0.0000

*** The constant term and all coefficients of the explanatory variables ($D(RUS)$ *and* COINTEQ01) are significant at less than 5 percent significance level.**

Table (9): Panel ARDL (Countries with fixed exchange rate regime)

Dependent variable: Domestic Interest Rate R_D (N = 150)

Variable	Coefficient	Standard error	$t-statitic$	Probability
		Long-Run		
RUS	0.950474	0.082849	11.47239	0.0000
		Short-Run		
COINTEQ01	-0.913769	0.165248	-3.109075	0.0023
C	-0.506201	0.133134	-3.8021917	0.0000
D(RUS)	1.429191	0.183553	7.786258	0.0000

*** The constant term and all coefficients of the explanatory variables ($D(RUS)$ *and* COINTEQ01) are significant at less than 5 percent significance level.**

The results in tables (8) and (9) indicate that domestic interest rates and the US interest rate are co-integrated in the two groups of MENA countries where, in both short-run and long-run, changes in the US interest rate tend to cause changes in interest rate of MENA countries irrespective of the exchange rate regime. However, the results show that the impact of the US interest rate on domestic interest rates in countries with relatively floating exchange rates converges slowly from the short-run to the long-run. The cointegration coefficient (the coefficient of adjustment or the Error Correction Coefficient) in table (8) indicates a relatively slow speed of adjustment where at least 4 years are needed to move to equilibrium in the long-run. In contrast, the impact of the US interest rate on domestic interest rates in countries with fixed (pegged) exchange rates converges almost instantaneously from the short-run to the long-run. The cointegration coefficient (the coefficient of adjustment or the Error Correction Coefficient) in table (9) indicates a relatively fast speed of adjustment where less than one year is needed to move to equilibrium in the long-run.

5. The Impulse Response

The impulse response of the three economic sectors is presented in figures (1) and (2). The figures are interpreted as follows:

- The magnitude of the shock in the independent variable (i.e., US interest rate RUS) is one standard deviation.
- The time horizon is 10 months forecasting.
- The red dots in the positive and negative regions of the graph are the standard error confidence bands.
- The solid black curve indicates the impact of the shock in short and long runs.
- Figure (1) shows the impulse response of domestic interest rate R_D in floating exchange rate countries for US interest rate RUS.
- Figure (2) shows the impulse response of domestic interest rate R_D in fixed exchange rate countries for US interest rate RUS.

Figure (1): Response of RD to RUS Innovation using Cholesky (d.f. adjusted) Factors
(Countries with Floating Exchange Rate)

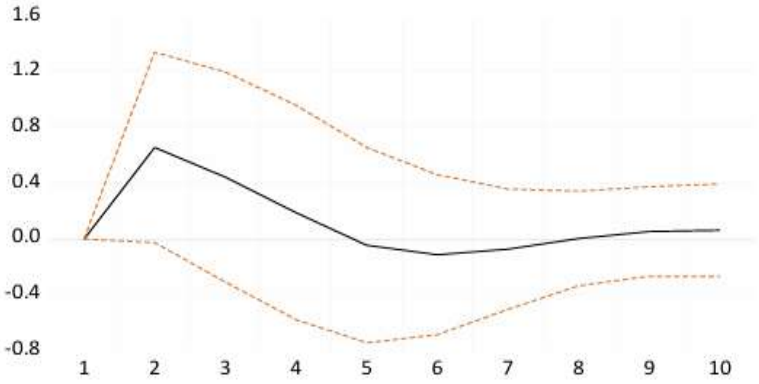

Figure (2): Response of RD to RUS Innovation using Cholesky (d.f. adjusted) Factors
(Countries with fixed exchange rates)

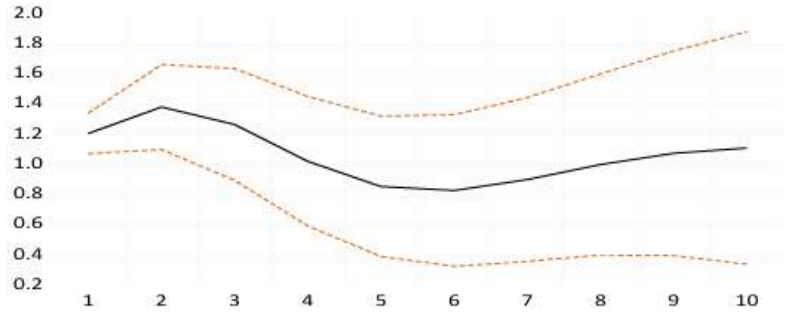

Figure (1) indicates that, while domestic interest rates in MENA countries with relatively floating exchange rates responds quickly to changes in the US interest rate in the short-run, the convergence to the long-run is very slow and weak. In contrast, domestic interest rates in MENA countries with fixed (pegged) exchange rates responds quickly to changes in the US interest rate in both short-run and long-run.

6. Conclusions

The main concern of this paper has been to investigate if the hypothesis of the interest rate parity holds for all MENA countries. to test this hypothesis, a model was developed in such a way the domestic interest rates in the MENA countries were set as a direct function of the foreign interest rates (i.e., the US interest rate). Following the notion of the interest rate parity, the relationship between foreign interest rates and domestic interest rates was, in our model, controlled by the domestic exchange rates (in MENA countries) and real GDP as a proxy of macroeconomic aggregates.

Panel data was employed in order to test for:

- Homogeneity among the sample countries by estimating Pooled OLS, Fixed Effect and Random Effect models.
- Short-run and long run effects by estimating a Pooled ARDL model.
- Impulse response by estimating a VAR model

The results show that the impact of the foreign interest rate on the domestic interest rates in the MENA countries varies among countries, where US interest rate has had greater impact on small economies with pegged exchange rate regime small open economies countries (i.e., Gulf countries, Lebanon and Jordan) than economies with floating exchange rates (i.e., Algeria, Egypt, Turkey, Iran, Morocco and Tunisia).

References

Ali, M. S., Ahmad, I., & Faizan, M. (2024). Uncovered interest rate parity phenomenon and determinants of domestic interest rates: an analysis of Pakistan and China economies. *Future Business Journal*, *10*(1), 35.

Ammer, J., De Pooter, M., Erceg, C. J., & Kamin, S. B. (2016). *International spillovers of monetary policy* (No. 2016-02-08-1). Board of Governors of the Federal Reserve System (US).

Arbatli, E. C., Firat, M., Furceri, D., & Verrier, J. (2022). Us monetary policy shock spillovers: Evidence from firm-level data.

Arbatli-Saxegaard, E. C., Furceri, D., Gonzalez Dominguez, P., Ostry, J. D., & Peiris, S. J. (2022). Spillovers from US monetary shocks: Role of policy drivers and cyclical conditions (No. 1317). ADBI Working Paper.

Arteta, C., Kamin, S. B., & Ruch, F. U. (2022). How do rising US interest rates affect emerging and developing economies? It depends (No. 10258). The World Bank.

Bräuning, F., & Sheremirov, V. (2019). Output spillovers from US monetary policy: The role of international trade and financial linkages.

Chi-Wei, S., Kai-Hua, W., Tao, R., & Lobonţ, O. R. (2019). Does the covered interest rate parity fit for China? *Ekonomska Istrazivanja*, *32*(1).

Di Giovanni, J., McCrary, J., & von Wachter, T. (2005). *Following Germany's Lead: Using International Monetary Linkages to Identify the Effect of Monetary Policy on the Economy* (No. 1495). IZA Discussion Papers.

Di Giovanni, J., & Shambaugh, J. C. (2008). The impact of foreign interest rates on the economy: The role of the exchange rate regime. *Journal of International economics*, *74*(2), 341-361.

Ehrmann, M., & Fratzscher, M. (2005). Equal size, equal role? Interest rate interdependence between the euro area and the United States. *The Economic Journal*, *115*(506), 928-948.

Engel, C. (2011). The real exchange rate, real interest rates, and the risk premium (No. w17116). National Bureau of Economic Research.

Fernandez, J. (2020). Exchange Rate Uncertainty and the Interest Rate Parity.

Frankel, J. A., & Roubini, N. (2001). The role of industrial country policies in emerging market crises.

Frankel, J., Schmukler, S. L., & Serven, L. (2004). Global transmission of interest rates: monetary independence and currency regime. *Journal of international Money and Finance*, *23*(5), 701-733.

Georgiadis, G. (2016). Determinants of global spillovers from US monetary policy. *Journal of international Money and Finance*, *67*, 41-61.

Kamin, S. B., Arteta, C., & Ruch, F. U. (2022). How Do Rising US Interest Rates Affect Emerging and Developing Economies?.

Kang, J. (2023). The Impact of the Fed's Interest Rate Hike on the Financial Industry: Focusing on the Exchange Market and Capital Market.

Kim, S. (2001). International transmission of US monetary policy shocks: Evidence from VAR's. *Journal of monetary Economics*, *48*(2), 339-372.

Iacoviello, M., & Navarro, G. (2019). Foreign effects of higher US interest rates. *Journal of International Money and Finance*, *95*, 232-250.

McKibbin, W. J., & Sachs, J. D. (2011). Global linkages: Macroeconomic interdependence and cooperation in the world economy. Brookings Institution Press.

Liu, T. Y., & Lee, C. C. (2022). Exchange rate fluctuations and interest rate policy. *International Journal of Finance & Economics*, *27*(3), 3531-3549.

Miranda-Agrippino, S., & Rey, H. (2020). US monetary policy and the global financial cycle. *The Review of Economic Studies*, *87*(6), 2754-2776.

Ogawa, E., Shimizu, J., & Luo, P. (2019). Effects of US interest rate hikes and global risk on daily capital flows in emerging market countries (Vol. 20). RIETI.

Polak, J. J., & White, W. H. (1955). The effect of income expansion on the quantity of money. *Staff Papers-International Monetary Fund*, *4*(3), 398-433.

Reinhart, C. M., & Reinhart, V. R. (2001). What hurts most? G-3 exchange rate or interest rate volatility.

Rey, H. (2015). Dilemma not trilemma: the global financial cycle and monetary policy independence (No. w21162). National Bureau of Economic Research.

Tian, M. (2024). Impact of the Federal Reserve Interest Rate Hikes on the US Dollar Exchange Rate. *Advances in Economics, Management and Political Sciences*, *78*, 67-72.

Uribe, M., & Yue, V. Z. (2006). Country spreads and emerging countries: Who drives whom?. *Journal of international Economics*, *69*(1), 6-36.

Valente, G. (2009). International interest rates and US monetary policy announcements: evidence from Hong Kong and Singapore. *Journal of International Money and Finance*, *28*(6), 920-940.