REMITTANCES, ECONOMIC GROWTH, AND FOOD SECURITY NEXUS IN TURKEY: AN ARDL APPROACH

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Introduction

- International migrations cause significant economic effects in terms of both the receiving countries and the sending countries.

- Remittances, compared to other private capital flows, are more stable and appears to help sustain investment in periods when the economy is down (Muratoglu, 2017).

- Based on the information obtained from the data of the United Nations Food and Agriculture Organization (2021), the research determined that Turkey ranks fourth in the highest calorie intake after Ireland, the USA and Belgium. Turkish people consume an average of 3,711 calories per day.

- High calorie consumption also raises obesity and the increase in cardiovascular diseases.

Literature

- Akçay and Karasoy (2017) investigated the causal relationship between remittances and calorie intake in Algeria for the period 1970-2008, using Johansen and Juselius cointegration tests, ARDL bounds testing approach and Granger causality test based on Vector Error Correction Model. They found that remittances positively and significantly affect calorie intake in the long- run.

- Ghosh (2018) investigated the direction of causality across economic growth and calorie intake in India using time series analysis. The results uncovered that economic growth Granger-causes nutritional intake however nutritional intake does not Granger-cause economic growth in India.

- Moniruzzaman (2022) investigated the influence of overseas remittances on household food security by employing a Two Stage Least Square Instrumental Variable Method (2SLS-IV) and Generalised Method of Moments (GMM). According to the findings, remittances have a considerable impact on food security conditions and so are an important component of family food security.

- Lastly, McFarlane et al. (2022) quantified food security in Jamaica as calorie intake and experimentally evaluated how it is influenced by remittances from 1976 to 2019. Within a robust vector error correction-modelling framework, they used impulse response function analysis and Granger causality testing. They discovered that remittances have a long-term positive impact on calorie consumption and vice versa. Furthermore, they revealed bidirectional Granger causation between remittances and calorie consumption.

Data and Methodology

■ The data is composed of Calories intake (expressed in kcal), Remittances (expressed as to GDP rate) and economic Growth (as a change of GDP), covering the period 1974-2018. Data of remittances and economic growth are obtained from World Bank, while food security data is obtained from Food and Agriculture Organization of the United Nations.

Summary Stats For Series

Variables	Obs.	Mean	Std. error	Skewness	Kurtosis	Min	Max
Calories intake	45	.0035921	.0001482	-1.112819	3.07238	.003187	.003775
Growth	45	2.773333	4.150214	-.7456473	2.847862	-7.1	9.5
Remittances	45	1.508156	1.114728	.1858283	1.978144	.122	4.01

Pearson's correlation coefficients for series

	Series		
	Calories intake	Growth	Remittances
Calories intake	1		
Growth	0.1226	1	
Remittances	-0.5117***	-0.1930	1

Note: *p<0.1, ** p<0.05, ***p<0.01.
Source: Own calculations.

ADF, KPSS, ZA unit root tests for series

	ADF statistics in levels	ADF statistics in first difference	KPSS statistics in levels	KPSS statistics in first difference	ZA statistics in levels	ZA statistics in first difference
Calories intake	-2.296 (0.1732)	-5.511 *** (0.0000)	2.31***	0.271	-4.771 [1985]	-9.793*** [1991]
Growth	-4.404*** (0.0003)	-7.337*** (0.0000)	0.148	0.0123***	-6.676*** [2003]	-7.404*** [2006]
Remittances	-1.443 (0.5614)	-5.112*** (0.0000)	0.223***	0.0602	-5.247 [2002]	-5.992*** [1998]

Note: In parenthesis are the p-values, in brackets are the break dates; *,
, * are the significance level respectively for 10, 5, and 1%.
Source: Own calculations.

Bound Test Results

Statistic	Critical values*		Conclusion
	Lower bound I(0)	Upper bound I(1)	
F-Statistics			
15.958	3.79	4.85	Cointegration
t-Statistics			
-6.889	-2.86	-3.53	Cointegration

Note:*at 5% significance.

Source: Own calculations

ARDL (1 1 0) model results

		Number of obs. =	44
		R-squared =	0.5585
		Adjusted R-squared =	0.5132

Log likelihood = -121.96503

D.Growth	Coefficient	P-values
ADJ		
Growth L1.	-1.070377***	0.000
LR		
Remittances	-.5739347	0.361
Kcalories	3213.164	0.510
SR		
Remittances D1.	-2.886798*	0.062
_cons	-8.784868	0.647

Note: *p<0.1, ** p<0.05, ***p<0.01.

Source: Own calculations.

Auto correlation Breusch-Godfrey LM test results

Lags(p)	Chi2	Prob> chi2
1	0.007	0.9346

Heteroskedasticity White's test results

Source	Chi2	Prob> chi2
Heteroskedasticity	9.05	0.8276
Skewness	5.40	0.2485
Kurtosis	0.67	0.4122
Total	15.13	0.7145

Source: Own calculations

Jarque-Bera normality test results

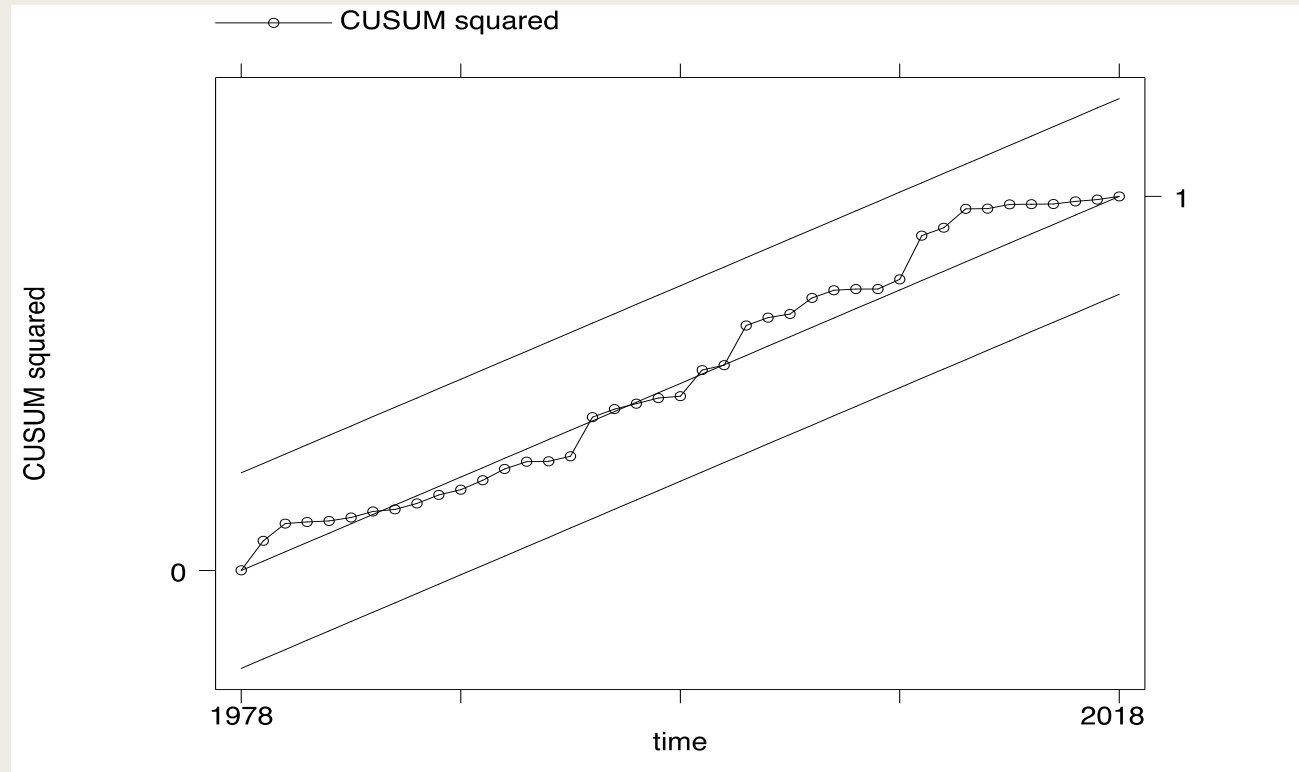| Jarque-Bera test	Chi2
4.696	0.0956

CUSUM of squares test results

Conclusion and implications

- The main findings of the work consist that there is a long-run relationship among variables, but there is only a strong, negative, significant correlation between remittances and calories intake.

- As the amount of remittances inflows to the country decreases, people increase their intake of cheap and unhealthy carbohydrates.

- So rising wage and salary incomes in Turkey can subsequently reduce the insufficient intake of calories.

Thanks for listening!