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THE INVESTMENT-SAVING PUZZLE IN MENA COUNTRIES: DISENTANGLING GROSS SAVING

The paper disentangles gross savings into government and private savings and investigate their impact on gross investment. Our methodology is based on a balanced panel of four MENA countries (Tunisia, Jordan, Egypt and Lebanon) for the period 2000-2017 by employing the Panel Vector Autoregressive Model (PVAR). Our findings show that government savings as a ratio of GDP does not have any impact on investment while private savings as a ratio of GDP does. Both variables exhibit the correct signs. The results also show that mobility of private saving is high and seemingly statistically inconsistent with the Fielstein and Horioka (1980) puzzle. Our paper also reveals that even though OECD countries are more open than our sample countries, the higher capital mobility of our sample is driven by the economic and political instability in the region.

Keywords: *Gross Investment, Government Savings, Private Saving, Governance, Vector Autoregressive Model.*

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1. INTRODUCTION

Saving and investment are essential in promoting economic growth. The relationship between them provides important implications for the current account dynamics, the international mobility of capital, and the economic growth. According to Rahman et al (2015), the basic argument behind this view is that "economic growth critically depends on capital formation, and capital formation stems from investment which depends on saving from domestic and foreign sources. Hence, an increase in saving leads to higher economic growth through capital formation".

The relationship between saving and investment has become a subject of debate among academics and researchers in the area of macroeconomics. According to Esso et al (2010), the debate has revolved around two issues "The first relates to whether domestic investment results in domestic saving, and the second relates to how domestic investment affect saving". Also, Ogbokor et al (2014) argue that the savings investment nexus is "the decisive question of fiscal policy". This implies that the budget deficits have a negative impact on domestic savings and capital formation in the economy.

Our interest in this paper is to test whether saving has any influence on investment. Due to large budget deficits in our sample countries, government saving is not expected to have a significant impact on investment. Therefore, we focus on private saving in terms of it degree of association with investment and the level of mobility.

In their standard well-known paper, Feldstein and Horioka (1980) conclude that the high saving – investment correlation is an evidence of low capital mobility. To this end, several empirical studies examined this relationship in industrial countries and tried to confirm their conclusion, and argued that cointegration between saving and investment suggests the capital is immobile (Feldstein 1983, Sachs 1981). On the other hand, some studies disagree with the Feldstein – Horioka theory and claim that there is no such long-run relationship between saving and investment. For example Wet and Eden (2005) show that investment in Sub-Saharan African countries is not determined by domestic saving rather it is determined by foreign aid and FDI flows. Also, Wahid et al (2004) find that there is a low correlation between saving and investment in the sample of five south Asian countries.

This paper examines the relationship between saving and investment for four Middle Eastern and North African counties (MENA) (Tunisia, Jordan, Egypt, and Lebanon), to verify whether the Feldstein and Horioka (1980) puzzle apply on those countries. To the best of our knowledge, only two studies have dealt with this issue in the MENA Counties (Bassam 2006 and Fachin et al 2011).

Nowadays, and due to political instability in the MENA countries resulted from Arab spring in the late 2010, the emphasis has shifted from economic policies towards managing balance of payment deficits, achieving high level of saving and investments in order to promote sustainable growth. By examining the relationship between savings and investments, the results of this study may provide academics and policy makers with an appropriate recommendation for formulating their policies in terms of boosting domestic saving and investment in order to promote economic growth in the MENA region. We are motivated by the fact that these countries suffer from chronic high budget deficits (negative government savings) which leads to higher current account deficits thereby increasing the saving investment gap. Thus, reducing budget deficit should lead to boosting the national saving and reducing the gap accordingly.

For this reason, this study uniquely disaggregates saving into its components, government and private, in order to focus on the individual effects of each variable on gross investment. Mobility is mainly influenced by the private saving behavior in countries that suffer from budget deficit and current account deficit and have financial sector liberalization such as our sample countries. This disaggregation helps in focusing on mobility as the private saving behavior is closely related to the investment behavior and saving is free to chase higher returns globally in liberalized countries. On the other hand, budget deficit does not have a reflection on mobility because government revenues are used to finance current and capital expenditures and therefore not mobile. Our aim is to test whether the saving – investment gap is related to mobility and conforms to the Feldstein and Horioka (1980) puzzle through private savings not gross savings. This is our contribution to the literature.

The study is organized as follows: Section 2 reviews the relevant literature. Section 3 contains the methodology and data sources. In section 4, the empirical findings are presented. Section 5, contains the conclusions and policy implications.

2. LITERATURE REVIEW

Many theoretical and empirical studies have been devoted to examine the relationship between saving and investment. From a theoretical point of view, classical and new classical economists argue that saving and investment are always equal at full employment income level. They believe that the equality between saving and investment is achieved by the rate of interest mechanism. In this regard, Ogbokor, et al (2014) argue that saving causes investment because “saving determines interest rate which in turn influences the demand for new capital”.

On the other hand, Keynes (1936) argues that the equality between saving and investment is achieved not by the rate of interest but by change in income level. This means that as investment spending increases, income level increases via the multiplier effect, thereby the saving level will increase. Kasimati (2011) argues that saving is not the primary determinant of investment. Empirically, Feldstein and Horioka (FH) (1980) examine the link between saving and investment in (OECD) counties during the period 1960-1974. Their results show a high correlation coefficient between domestic saving and investment, which implies low capital mobility (a value of 1 means immobility and 0 highest mobility) in the (OECD) region. They also conclude that in a country or a region where capital is fully mobile, investment and saving are not related. The Feldstein and Horioka (1980) theory raised a strong debate in the literature in two directions.

The first group that support the theory consists, among others, Feldstein (1983), Vos (1988), Georgopoulos and Hejazi (2005), Nell et al (2008), and Hurlin and Rabaud (2008). Miller (1988) finds that saving and investment are correlated under fixed exchange rate regime while they are not cointegrated under the flexible exchange rate regime. The second group that disagree with the theory contends that the strong correlation between saving and investment is explained by many external factors such as population growth, country size, productivity shocks, current account position, level of income and Fiscal policy (Georgopoulos and Hejazi 2005, Mamingi 1993 and Sachsida and Cactano 2000).

Working on a sample of OECD countries during the period (1970-2003), Bebczuk et al (2010) conclude that the FH coefficients are higher in deficit years than in surplus years. Also, they find that the long-run relationship is less than 1 in all cases. Saeed et al (2012) test the FH theory in the presence of twin deficit in Pakistan during the period (1972-2008). They suggest that the FH puzzle does not exist in Pakistan because the country is not perfectly integrated into the world economy. Also, Sachsida and Cactano (2000) raise doubts about the FH theory and suggest that "the F–H coefficient does not represent capital mobility. Instead, it is a substitutability relation between external and domestic savings". Wet and Eyden (2005) find that the rate of investment in the Sub-Saharan African counters are not determined by domestic saving but by foreign aid and foreign direct investment inflows.

Also, Esso and Keho (2010) show that domestic saving plays an active role in financing investment in only three UEMOA countries out of seven included in the study. Bassam (2006) reports that saving and investment in the MENA countries are not cointegrated, implying that no long-run relationship between them. Fachin et al (2011) show the existence of a long-run relationship between saving and investment in the Gulf Arab states and conclude that "these countries have large current account surplus, such relationship cannot be explained by standard arguments".

Even though the above studies extensively examined the empirical relationship between gross investment and gross savings, none disaggregated gross saving into its components. This study is breaking down gross savings into government and private savings. We believe that the main driver of gross investment is private savings because government saving is negative and budget revenues are used to finance budget expenditures. Furthermore, the literature is split between the two arguments, some studies show a strong relationship between investment and saving while others show a weak association in favor of the mobility argument. This study is trying to add to the existing literature by offering an evidence from four Middle Eastern countries.

3. METHODOLOGY

Due to the common economic problems facing Tunisia, Jordan, Egypt and Lebanon such as low saving rates, low real growth rates, high unemployment rates, high budget deficits, high current account deficits, and high public debt ratios, these countries are targeted in this paper, as shown in the Table 1.

Table 1:

MACROECONOMIC INDICATORS

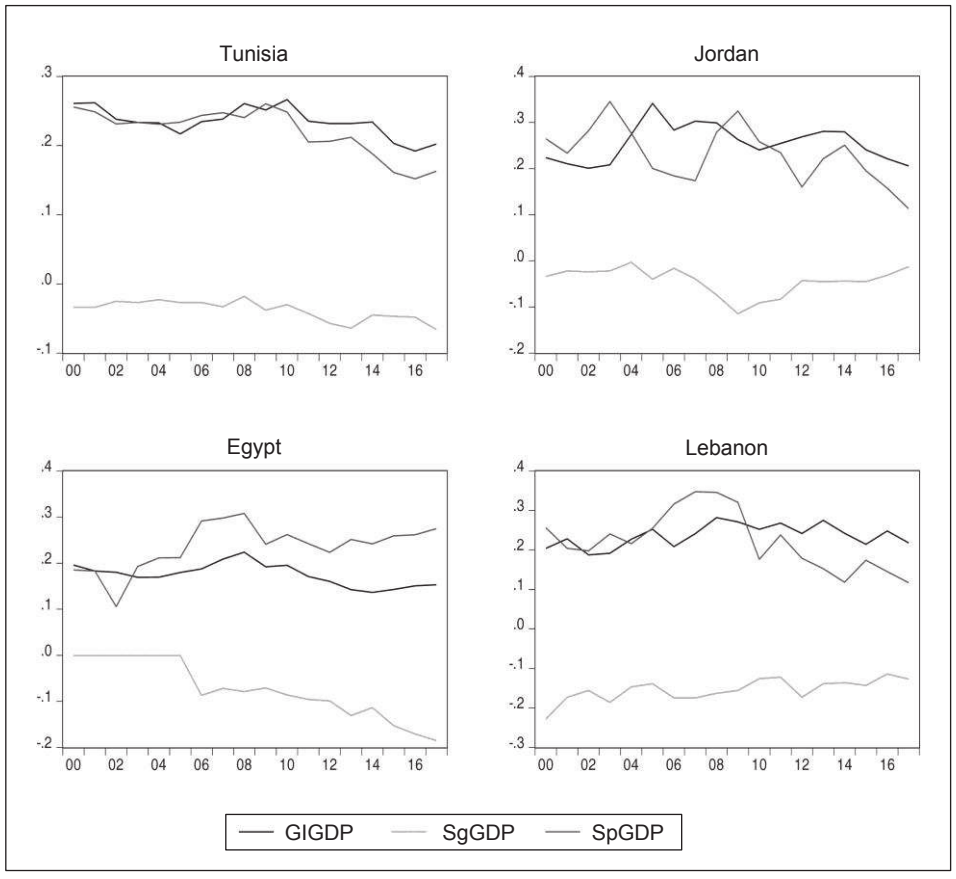
	Jordan		**Tunisia**		**Egypt**		**Lebanon**	
	2000	**2017**	**2000**	**2017**	**2000**	**2017**	**2000**	**2017**
Foreign Direct Investment (%GDP)	10.7	5.1	3.5	2.1	1.2	3	5.8	4.9
External Loans (%GDP)	129	75	55.3	82.0	33	35.9	57.3	141.7
Budget Deficit (%GDP)	-3.4	-1.4	-3.4	-6.6	-5.5	-18.5	-22.8	-12.8
Current Account Balance (%GDP)	0.1	-10.6	-3.9	-10.5	-1.1	-6.3	-17.6	-22.8
Real Growth (%)	4.3	1.9	4.7	2.0	5.4	4.1	1.3	2.0
Unemployment Rate (%)	13.2	15	15.1	15.4	8.9	12.0	8.4	6.6
Investment (%GDP)	22.4	20.6	26.1	20.6	19.6	15.3	20.4	21.8
Saving (%GDP)	20.8	-10.3	22.2	10.1	18.1	10.8	-3.1	6.5
Outstanding Public Debt (%GDP)	98	95	65	70	71.0	101.1	145	149

Source: World Bank national accounts data, OECD National Accounts data files and the Globaleconomy.com

Furthermore, the four countries suffer from the dominating share of current expenditures in total expenditures which has less impact on gross investment compared to capital expenditures. As such, capital expenditures are not playing the expected role in driving investment due to the chronic deficits that these countries are facing. In other words, our rational is based on the fact that budget deficit in the four countries included in this study absorbs a large portion of gross savings rather than financing gross investment. Figure 1 below shows that the fiscal stance in the four countries is negative and weakly related to gross investment while private saving is closely related to gross investment.

Figure 1:

THE FISCAL STANCE, GROSS INVESTMENT, GROSS SAVING AND PRIVATE SAVING



Source: Authors' estimation

We use Panel VAR analysis because the interest is the group (countries) rather than the individual countries and that panel estimation reduces the noise emerging from the time series of a single country. Gross investment to GDP is the dependent variable. Government saving to GDP and private saving to GDP are the explanatory variables. Our methodology is based on a balanced panel of four MENA countries for the period 2000-2017.

For gross investment as the endogenous variable, the model takes the following form:

$$GIGDP_t = \beta_1 + \beta_2 GIGDP_{t-i} + \beta_3 SGGDP_{t-i} + \beta_4 SPGDP_{t-i} + \mu_t \quad (1)$$

Where $\boldsymbol{\beta_1}$ is the fixed term, intercept, $\boldsymbol{\mu_t}$ is the error term and i is the lag length. The term $GIGDP_{it}$ represents the ratio of gross investment to GDP for each country. The term $SGGDP_{t-i}$ is the lagged share of government saving to GDP and $SPGDP_{t-i}$ is the lagged share of private saving to GDP. Variable measurement, sources and expected sign are summarized in Table 2.

Table 2:

VARIABLE MEASUREMENT, SOURCES AND EXPECTED SIGNS

Variable Name	**Measurements**	**Sources**	**Expected Sign**
Dependent variable			
GIGDP	Gross investment as a ratio of GDP	World Bank national accounts data, and OECD National Accounts data files and the Globaleconomy.com	------
Independent variables			
SGGDP	Government saving (Budget Balance) as a ratio of GDP	World Bank national accounts data, and OECD National Accounts data files and the Globaleconomy.com	+
SPGDP	Private saving as a ratio of GDP	World Bank national accounts data, and OECD National Accounts data files and the Globaleconomy.com	+

This paper estimates the stationarity properties of the variables and the Panel cointegration test in order to select between the Panel VAR model and the Panel Vector Error Correction Model (VECM).

3.1 Unit root test

Before estimating equation (1), (VECM) requires testing the properties of the time series using the panel unit root tests developed by Levin, Lin and Chu (2002) (LLC), Lm, Pesaran and Shin (2003) (IPS), ADF-Fisher Chi-square and PP-Fisher Chi-square. "The LLC is an extension of the standard (Augmented) Dickey-Fuller test and assumes parameter homogeneity while the IPS allows for heterogeneity across the panel and serial correlation in the error terms. Both the LLC and IPS may lead to erroneous results if there is cross-sectional dependence among the panel members emanating from, for example, common effects" (Ali and Alpaslan, 2013). To account for the possible cross-sectional dependence, we use Pesaran (2007) cross-sectional augmented panel unit root test.

The unit root tests as developed by the Augmented Dickey-Fuller (ADF) method are described below:

A) Unit root test with intercept

$$GIGDP_t = \alpha + \delta GIGDP_{t-1} + \mu_t \tag{2}$$

B) Unit root test with intercept and trend

$$GIGDP_t = \alpha + \beta_T + \delta GIGDP_{t-1} + \mu_t \tag{3}$$

C) Unit root test without intercept and trend

$$GIGDP_t = \delta GIGDP_{t-1} + \mu_t \tag{4}$$

The null hypothesis states that each series has a unit root at level. Table (3): reveals that all variables (GIGDP, SGGDP, and SPGDP) have unit root at levels and stationary at first difference that is integrated of order 1 or I(1). This make them eligible for the Johansen cointegration test. According to the lag length criterion based on Schwarz Information Criterion (SC) and Hannan-Quinn Information Criterion (HQ), we use a lag of order 1 (Table 4).

3.2 Cointegration Test

Based on the above findings, we can proceed to check whether a panel cointegration relationship exists among the three variables. Based on the Pedroni Residual Cointegration Test (Table 5), there is no cointegration relationship as all of the 'Within Dimension' statistics (panel v, rho, pp and AFF), except one, and

the 'Between Dimensin' statistics (group rho, pp and AFF), except one, are not significant. Therefore, the Panel VAR is more appropriate in such cases compared to the Panel VECM (which requires that the variables be I(1) and cointegrated). Panel VAR system can be represented as follows:

$$GIGDP_{it} = \beta + \sum_{i=1}^{n} \beta_i GIGDP_{t-i} + \sum_{j=1}^{n} \varphi_j SGGDP_{t-j} + \sum_{m=1}^{n} \varphi_m SPGDP_{t-j} + \mu_{1t} \quad (5)$$

$$GIGDP_{it} = \sigma + \sum_{i=1}^{n} \beta_i GIGDP_{t-i} + \sum_{j=1}^{n} \varphi_j SGGDP_{t-j} + \sum_{m=1}^{n} \varphi_m SPGDP_{t-j} + \mu_{2t} \quad (6)$$

$$GIGDP_{it} = \theta + \sum_{i=1}^{n} \beta_i GIGDP_{t-i} + \sum_{j=1}^{n} \varphi_j SGGDP_{t-j} + \sum_{m=1}^{n} \varphi_m SPGDP_{t-j} + \mu_{3t} \quad (7)$$

Furthermore, the Johansen-Fisher Cointegration test (Table 6) reveals the absence of a long run relationship (the null hypothesis of no cointegration is therefore not rejected) while the Kao Residual Cointegration test (Table 7) reveals the opposite. Since most of the test statistics confirm the absence of a long run relationship and all the variables are of I(1) order (stationary), Panel VAR model is supported.

3.3 The Panel Vector Error Correction Model

We estimate the Panel VECM for robustness and confirmation as the Kao Residual Cointegration test supports the existence of a long run relationship. The Prob. value of the Kao Residual Cointegration test is 0.0320 suggesting the existence of a long run relationship among the variables. The estimation of a Panel VECM proceeds by regressing the first difference of each endogenous variable on a one period lag of the cointegrating equation(s) (the long run dynamics) and lagged first differences of all the endogenous variables in the system (the short run dynamics) (following Engle and Granger (1987)). The term (Q) represents a vector of the independent variables (government saving and private saving both as a ratio of GDP) and (Z) represents the long-term relationship or the error correction term (EC) in the following model:

$$\Delta GIGDP_{it} = \alpha_0 + \sum_{i=1}^{n} \beta_i GIGDP_{t-i} + \sum_{i=0}^{n} \Omega_i \Delta Q_{t-i} + \Theta_t Z_{t-1} + V_t \quad (8)$$

Where ***n*** is the optimal lag length and the terms $\sum_{i=1}^{n} \beta_i GIGDP_{t-i}$ and $\sum_{i=0}^{n} \Omega_i \Delta Q_{t-i}$ represent the short run relationships and the error correction term (Θ_t) represents

the speed of adjustment of GIGDP in response to changes in Z. The term Z, which is the vector of deviations from the long run relation, can be normalized and its long run equation (cointegration equation) can be expressed as:

$$EC_{t-1} = Z_{t-1} = GIGDP_{t-1} - \beta_0 - \beta_i Q_{t-i} \tag{9}$$

$$GIGDP_t = \beta_0 + \beta_1 Q_t + \varepsilon_t \tag{10}$$

This two-step procedure is introduced by Pesaran et al. (1999), the long-run dynamics specified in equation (10) is estimated first to obtain the residuals which are now called the error correction term. Second, the error correction model is generated (as in 9 above).

4. EMPIRICAL RESULTS

4.1 The Panel VECM

Table (8) reports the Panel (VECM) results. Since the signs of the parameters are the opposite in the long run, the findings show that in the long run government saving is not significant and private saving is significant and both have the expected signs, as rising government saving (lowering budget deficit) is associated with increased gross investment, and rising private saving positively affect gross investment. The speed of adjustments (Θ) which is associated with the coefficient C1 (-0.05) is negative and significant at the 5 percent level. This means that about 5 percent of the deviations from the long run equilibrium is corrected gradually within one year. That is, if there is a departure in one direction from the long run equilibrium, the correction would have to be pulled back to the other direction and equilibrium is retained.

In the short run, the coefficient C2 is associated with our dependent variable gross investment to GDP lagged once. Our main interest is (C3 and C4). The results show that government saving to GDP and private saving to GDP do not cause gross investment. Both of the independent variables are not significant in the short run and exhibit the wrong sings (Table 8). However, due to the suspicions about the validity of the model regarding the existence of the cointegration as indicated in the Pedroni Residual Cointegration Test (Table 5) and the goodness of fit indicators (R-square 10 percent and F-statistic 1.67), we focus on the Panel VAR model.

4.2 The Panel VAR

Whenever there are doubts about the VECM, estimating the VAR model is more appropriate. The optimal lag is one based on the standard criteria, Hannan-Quinn Information and Schwartz Information (Table 4). The model consists of 3 variables with 1 lag. Testing consists of two methods, the fixed effect and the random effect and their results are reported in Tables 9 and 10, respectively. The standard procedure to select between both methods is to apply the Hausman test which specifies the null hypothesis to be the random effect model as the appropriate model. The results indicate that the Prob. value of the Chi-square statistic is 0.006 (Table 11). Therefore, the null hypothesis is rejected and the suitable model is the fixed effect.

Table (9) which presents the outcome of the fixed effect model reveals that SGGDP is significant at 10 percent and SPGDP is highly significant, both exhibit the correct signs. As government saving increases (meaning a decline in budget deficit) by 1 percent, gross investment increases by 14 percent and as private saving increases by 1 percent, gross investment increases by 14 percent. The result of government saving is not surprising due to the following reasons:

i) These countries suffer from chronic budget deficits as discussed in the introduction section, therefore, mobility cannot be discussed in terms of budget deficit, government revenues are used to cover these deficits.

ii) In spite of the existence of government capital expenditures which should be channeled towards investment, unfortunately government capital expenditures is minimal in total spending on the one hand and a large part of capital spending is classified as current spending (salaries, operational expenses, utilities, etc.).

iii) Financing the government capital expenditures is coming mainly from external borrowings and internal borrowings. Large parts of new borrowings are used to pay off outstanding debt not to support investment.

iv) External borrowings increase governments' debt burden which comes at the expense of investment and there are doubts about the feasibility of government capital projects.

v) Internal borrowings creates the so-called crowding out effects which raises the cost of funds and curbs investment. However, the increase in the cost of funds resulting from the high borrowings has little impact on raising private savings as savings depend to a large degree on the disposable income which is still low compared to developed countries and some of the neighboring developing countries in the region.

When it comes to private savings, it is worth noting that the four countries are open to a large degree and the results support this argument. The coefficient of private saving is only 14 percent suggesting that mobility is high and seemingly statistically inconsistent with the Fielstein and Horioka (1980) puzzle. It is true that OECD countries are more open than our sample countries, our sample show higher mobility due to the higher uncertainty arising from the economic and political environment in the region. Indeed, political instability is the driving force behind the high mobility of private savings externally.

The above discussion is supported by the outcomes of the VAR model and the Variance Decomposition as presented below.

4.3 The Panel VAR and Variance Decomposition

Given that all variables are I(1) with optimal lag level of one, we can interpret the VAR and the Variance Decomposition results as reported in Tables (12 and 13, respectively). Assuming the short run is years 1 and 2 and the long run year is 5 into the future, Table 13 shows that gross investment as a ratio of GDP (SGGDP) is mainly influenced by own shocks in the short run (years1 and 2) with values of (100 percent and 97.9 percent, respectively) and the long run (year 5) with a value of (87.75 percent). Government savings to GDP (SGGDP) does not have any effect at all times while private savings to GDP (SPGDP) appears to have an effect in the long run (10.19 percent) more than the short run (1.69 percent). These results are consistent with both the VAR (Table 12) and the fixed effect (Table 9) models as both confirm the high impact of own shock. Also, both show that SGGDP does not have an impact and that SPGDP has reasonable impact and statistically significant.

5. CONCLUSION AND POLICY IMPLICATIONS

Disentangling gross savings into government and private savings reveals two interesting results. First, government savings are not relevant because of the chronic budget deficits. Second, private saving is highly significant but also highly mobile. This outcome is seemingly inconsistent with the FH theory. However, this does not mean that these countries are more integrated with the world economy than the FH OECD countries rather, it is the prevailing political and economic instability that stands behind the external high mobility of private savings. The above results put strong challenges on these countries to eliminate budget deficits completely

through efficient revenues collection mechanisms and rationalizing government expenditures. This minimizes the crowding out effect and boosts private savings. They also need to boost economic growth and create attractive environment for foreign and domestic investment. It is true that political instability is to a large extent beyond the control of these countries, however, they need to keep working towards achieving greater stability as well as sound economic management. Finally, these countries need to fight corruption and implement sound governance guidelines.

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APPENDICES

Table 3:

PANEL UNIT ROOT TEST: SUMMARY

At 5 % Level	**Level Prob.**			**First Difference Prob.**		
	GIGDP	*SGGDP*	*SPGDP*	*D(GIGDP)*	*D(SGGDP)*	*D(SPGDP)*
Levin, Lin & Chu	0.25	0.29	0.39	0.0000	0.0000	0.0000
Im, Pesaran and Shin	0.22	0.42	0.54	0.0000	0.0000	0.0000
ADF-Fisher Chi-square	0.27	0.21	0.55	0.0000	0.0000	0.0000
PP-Fisher Chi-square	0.37	0.20	0.75	0.0000	0.0000	0.0000

Source: Authors' estimation

Table 4:

VAR LAG ORDER SELECTION CRITERIA

Endogenous variables: GIGDP SGGDP SPGDP					
Lag	**LogL**	**LR**	**FPE**	**AIC**	**SC**
0	230.7112	NA	1.52e-08	-9.487968	-9.371018
1	331.2030	184.2349	3.36e-10	-13.30013	-12.83233*
2	340.9329	16.62183	3.28e-10*	-13.33054	-12.51189
3	343.8744	4.657456	4.27e-10	-13.07810	-11.90860
4	347.8197	5.753517	5.40e-10	-12.86749	-11.34714
5	357.2491	12.57250	5.51e-10	-12.88538	-11.01418
6	378.4993	25.67734*	3.50e-10	-13.39580*	-11.17375

Source: Authors' estimation

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level),
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 5:

PEDRONI RESIDUAL COINTEGRATION TEST

	Individual Intercept		**Individual Intercept and Trend**		**No Intercept No Trend**	
	Prob.	**Weighted Prob.**	**Prob.**	**Weighted Prob.**	**Prob.**	**Weighted Prob.**
1) Within Dimension						
Panel v- statistic	0.32	0.72	0.83	0.96	0.81	0.88
Panel rho- statistic	0.67	0.39	0.86	0.72	0.18	0.14
Panel pp- statistic	0.56	0.18	0.72	0.28	0.07	0.01
Panel AFF- statistic	0.15	0.16	0.17	0.20	0.07	0.31
2) Between Dimension						
Group rho-stat.	0.75	–	0.92	–	0.17	–
Group pp-stat.	0.37	–	0.54	–	0.00	–
Group ADF-stat.	0.39	–	0.53	–	0.07	–

Source: Authors' estimation

Table 6:

JOHANSEN FISHER PANEL

	No Intercept or Trend		**Intercept No Trend**	
Hypothesized No. of CE(s)	**Trace Prob**	**Max eigen Prob.**	**Trace Prob**	**Max eigen Prob.**
None	0.64	0.53	0.46	0.62
At most 1	0.92	0.89	0.60	0.58
At most 2	0.90	0.90	0.05	0.36

Source: Authors' estimation

Table 7:

KAO RESIDUAL COINTEGRATION TEST

	t-statistic	***Prob.***
ADF	-1.8515	0.0320

Source: Authors' estimation

Table 8:

VECTOR ERROR CORRECTION ESTIMATES

Standard errors in ( ) & t-statistics in [ ]			
Cointegrating Eq:	**CointEq1**		
GIGDP(-1)	1.000000		
SGGDP(-1)	-0.572708 (0.74118) [-0.77270]		
SPGDP(-1)	-3.128706 (0.90802) [-3.44562]		
C	0.448617		
Error Correction:	**D(GIGDP)**	**D(SGGDP)**	**D(SPGDP)**
CointEq1	-0.050356 (0.02128) [-2.36644]	-0.009911 (0.01962) [-0.50504]	0.083211 (0.03896) [2.13585]
D(GIGDP(-1))	-0.122355 (0.12703) [-0.96320]	-0.050267 (0.11715) [-0.42910]	-0.052837 (0.23257) [-0.22718]
D(SGGDP(-1))	-0.015935 (0.15246) [-0.10451]	-0.214270 (0.14060) [-1.52395]	-0.061056 (0.27914) [-0.21873]
D(SPGDP(-1))	-0.053180 (0.08512) [-0.62478]	-0.100156 (0.07850) [-1.27593]	0.086123 (0.15584) [0.55264]
C	-0.001990 (0.00308) [-0.64687]	-0.003187 (0.00284) [-1.12367]	-0.002939 (0.00563) [-0.52198]
R-squared	0.101808	0.054840	0.078734
Adj. R-squared	0.040913	-0.009238	0.016275
Sum sq. resids	0.035025	0.029787	0.117404
S.E. equation	0.024365	0.022469	0.044608
F-statistic	1.671870	0.855831	1.260573

Source: Authors' estimation

Table 9:

FIXED EFFECT

Dependent Variable: GIGDP Method: Panel Least Squares				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.069551	0.025364	2.742079	0.0080
GIGDP(-1)	0.582748	0.098625	5.908708	0.0000
SGGDP(-1)	0.143046	0.085409	1.674843	0.0991
SPGDP(-1)	0.149795	0.055470	2.700467	0.0089
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.761327	Mean dependent var		0.225432
Adjusted R-squared	0.737851	S.D. dependent var		0.042629
S.E. of regression	0.021826	Akaike info criterion		-4.714162
Sum squared resid	0.029059	Schwarz criterion		-4.485683
Log likelihood	167.2815	Hannan-Quinn criter.		-4.623632
F-statistic	32.42990	Durbin-Watson stat		2.102569
Prob(F-statistic)	0.000000			

Source: Authors' estimation

Table 10:

RANDOM EFFECT

Dependent Variable: GIGDP Method: Panel EGLS (Cross-section random effects)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.009649	0.018681	0.516487	0.6073
GIGDP(-1)	0.842272	0.064012	13.15812	0.0000
SGGDP(-1)	0.006847	0.046437	0.147439	0.8832
SPGDP(-1)	0.108917	0.051724	2.105737	0.0392
Effects Specification				
			S.D.	**Rho**
Cross-section random			3.35E-09	0.0000
Idiosyncratic random			0.021826	1.0000
Weighted Statistics				
R-squared	0.712573	Mean dependent var		0.225432
Adjusted R-squared	0.699100	S.D. dependent var		0.042629
S.E. of regression	0.023384	Sum squared resid		0.034995
F-statistic	52.88838	Durbin-Watson stat		2.164100
Prob(F-statistic)	0.000000			

Source: Authors' estimation

Table 11:

HAUSMAN TEST CORRELATED RANDOM EFFECTS

Correlated Random Effects – Hausman Test Equation: Untitled Test cross-section random effects				
Test Summary		**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random		12.460460	3	0.0060
Cross-section random effects test comparisons:				
Variable	**Fixed**	**Random**	**Var(Diff.)**	**Prob.**
GIGDP(-1)	0.582748	0.842272	0.005629	0.0005
SGGDP(-1)	0.143046	0.006847	0.005138	0.0574
SPGDP(-1)	0.149795	0.108917	0.000402	0.0414

Source: Authors' estimation

Table 12:

VECTOR AUTOREGRESSION ESTIMATES

Standard errors in ( ) & t-statistics in [ ]			
	GIGDP	**SGGDP**	**SPGDP**
GIGDP(-1)	0.842272 (0.06858) [12.2817]	0.054449 (0.06551) [0.83121]	-0.165598 (0.12320) [-1.34414]
SGGDP(-1)	0.006847 (0.04975) [0.13762]	0.896238 (0.04752) [18.8598]	0.045050 (0.08937) [0.50406]
SPGDP(-1)	0.108917 (0.05542) [1.96547]	0.024943 (0.05293) [0.47124]	0.738887 (0.09955) [7.42223]
C	0.009649 (0.02001) [0.48208]	-0.027444 (0.01912) [-1.43556]	0.096952 (0.03595) [2.69651]
R-squared	0.712573	0.855239	0.473574
Adj. R-squared	0.699100	0.848453	0.448897
Sum sq. resids	0.034995	0.031929	0.112937
S.E. equation	0.023384	0.022336	0.042008

Source: Authors' estimation

Table 13:

VARIANCE DECOMPOSITION OF GIGDP

Period	**S.E.**	**GIGDP**	**SGGDP**	**SPGDP**
1	0.023384	100.0000	0.000000	0.000000
2	0.031038	97.89516	0.410124	1.694719
3	0.035871	94.53936	1.013305	4.447338
4	0.039183	90.97964	1.594013	7.426350
5	0.041495	87.75090	2.060824	10.18828

Source: Authors' estimation

ODNOS INVESTICIJA I ŠTEDNJE U MENA ZEMLJAMA: RAZDVAJANJE BRUTO ŠTEDNJE

Sažetak

Rad razgraničava bruto štednju na državnu i privatnu štednju te istražuje njihov utjecaj na bruto investicije. Metodologija se temelji na uravnoteženom panelu četiri zemlje Bliskog istoka i Afrike (Tunis, Jordan, Egipat i Libanon) za razdoblje od 2000. do 2017. primjenom panel vektorskog autoregreijskog modela (PVAR). Rezultati pokazuju da državna štednja kao omjer BDP-a nema utjecaja na investicije, dok privatna štednja kao omjer BDP -a ima. Obje varijable potvrđuju očekivani predznak. Rezultati također pokazuju da je mobilnost privatne štednje velika i naizgled statistički neusklađena s zagonetkom Fielstein i Horioka (1980.). Ovaj članak također otkriva da, iako su zemlje OECD-a otvorenije od zemalja promatranog uzorka, veća mobilnost kapitala promatranog uzorka je posljedica ekonomske i političke nestabilnosti u regiji.

Ključne riječi: Bruto investicije, državna štednja, privatna štednja, upravljanje, vektorski autoregresijski model.