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RESEARCH ARTICLE

Economic Vulnerability and Economic Growth: What is the Role of Institutions for MENA Countries?

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Abstract

This paper analyzes the role of institutions in mitigating the negative effects of shocks of terms of trade on economic growth. Utilizing a dynamic panel data approach for 15 MENA countries over the period 1996-2010, the results demonstrate that good institutional quality helps to mitigate the negative effects of economic vulnerability on economic growth. We also conclude that interaction terms between trade openness and institutions can reducing the negative effects of trade shocks linked to terms of trade fluctuations and trade openness can stimulate economic growth only when the threshold institutional level is reached.

Introduction

MENA countries have experienced, since the first oil shock of 1973, high economic growth instability due to several factors, which are mainly terms of trade fluctuations and changes in economic policies in these countries. The dependence of MENA countries exports on the demand of the major world markets increases their economic vulnerability. In addition, the effects of the instability of terms of trade on economic growth can be transmitted through institutional factors: these effects can be mitigated or otherwise amplified by the quality of political institutions and modes of governance.

Economic vulnerability is the risk for a country to be affected by exogenous shocks. These shocks can be internal or external. Internal shocks can be natural such as weather conditions including the effects of drought earth quakes, floods, etc.

Economies can be exposed to two types of external shocks: commercial external shocks such as changes in external demand and instability of terms of trade, and financial external shocks like global financial recession or crisis.

A large literature highlights the role of shocks of terms of trade in determining economic growth volatility. Based on forty industrialized and developing countries, Mendoza (1997) find that terms of trade fluctuations reduce investment and thus decrease economic growth because of risk aversion, while an improvement in terms of trade leads to high levels of investment and thus improves long term economic growth. Bleaney and Greenway (2001) estimate a panel of Saharans countries between 1985 and 1995 in order to study the effect of terms of trade on investment and economic growth. They conclude that an improvement in terms of trade can enhance these latters. According to this study, investment and uncertainty are the main channels through which terms of trade fluctuations affect economic growth. Easterly and al. (1993) study the differences between countries in their long- term growth and find that the effect of terms of trade shocks plays an important role in explaining the variance of growth.

Many studies highlight the importance of institutional quality as a key determinant of economic growth (North (1991), Rodrik and Subramanian (2003), Acemoglu (2008) and Rodrik (2008)). Other studies have given importance to the role of political institutions in mitigating or amplifying the effects of economic vulnerability. Rodrik (1999), for example, find that countries which have experienced significant declines in economic growth after 1975, were those characterized by weak governance. He shows that social conflicts interact with external shocks on the one hand and with political institutions on the other hand.

Guillaumont (2006) also argues that the effects of economic vulnerability depend on institutional policies. Policy and institutions have an important role in mitigating shocks "that is to say, the country's ability to effectively

manage external shocks". In light of these considerations, our study contributes by examining the role of institutions in mitigating the negative effect of economic vulnerability on economic growth.
The scope of our study covers 15 MENA countries, during the period 1996- 2010. Panel data techniques are used to study the impact of the mode of governance as well as the interactions terms between trade openness and institutions on the relationship between the shocks of terms of trade and economic growth.
The rest of the paper is organized as follows: Section 2 analyzes economic vulnerability and governance in MENA countries. Section 3 exposes an empirical study on the role of institutions in mitigating the negative impact of economic vulnerability on economic growth. Section 4 concludes.

2. COMMERCIAL OPENNESS AND ECONOMIC VULNERABILITY IN MENA COUNTRIES

This section describes the vulnerability of MENA countries to terms of trade shocks and the low institutional quality in these countries.

2.1. Commercial openness and trade shocks vulnerability

Although trade openness entails a better resources allocation and technological transfer, increases exports and hence stimulates economic growth, the most integrated MENA countries have been exposed to trade shocks since the 1973 oil crisis, entailing excessive growth rates volatilities.
MENA countries have a high vulnerability to terms of trade shocks because their exports are limited to a small number of products. Fuel in oil exporting MENA countries provides 85% of exports (World Bank, 2009). For other MENA countries which are poor in natural resources, their degrees of export concentration are high: they export poor technological component- manufactured products like textile and shoes.
High export concentration on small number of products weakens MENA economies and exposes them to basic products price shocks. It also contributes to excessive fluctuations of export receipts and consequently high economic growth volatility. The higher the export parts in the GDP, the stronger the impact of the fall in exports (Guillaumont, 2006).

2.2. Economic vulnerability measure

Rodrik (1999) measures economic vulnerability as a standard deviation of terms of trade weighted by total trade part on GDP. Rodrik argues that it's an appropriate indicator for external volatility. The economic vulnerability indicator is calculated as:

$$VE = \sigma_{TE} * \left[(X + M) / PIB \right]$$

Where:

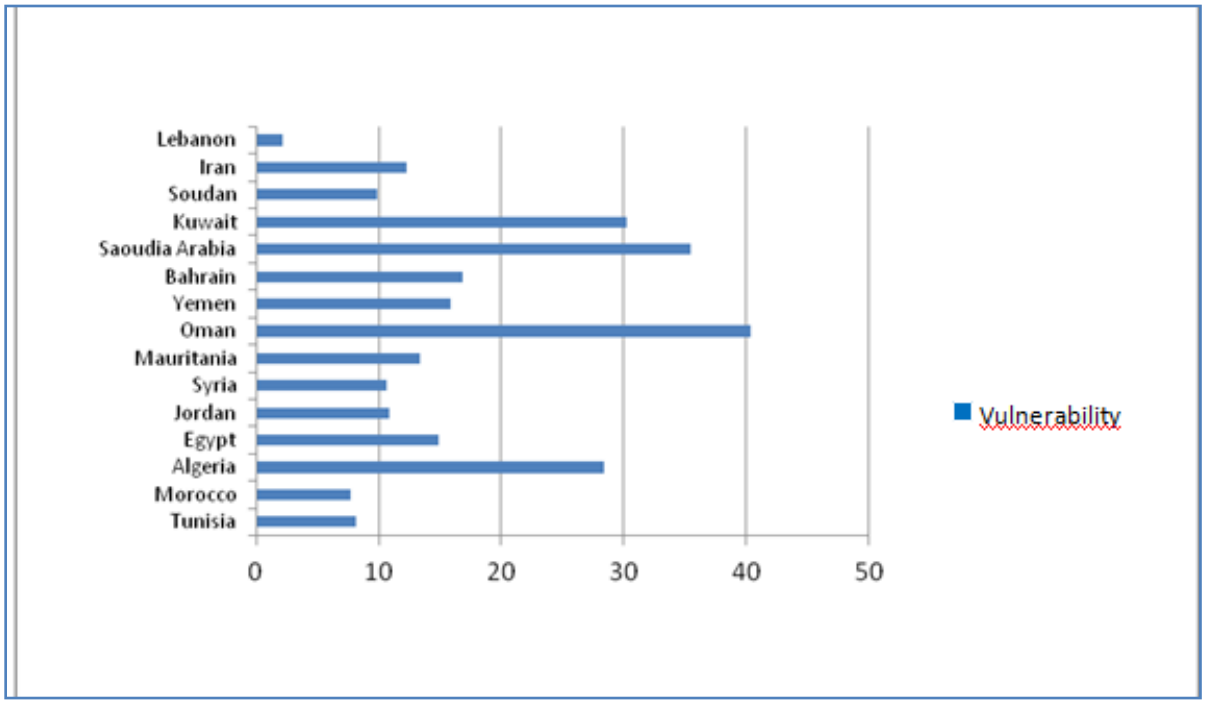
σ_{TE} is the standard deviation of terms of trade;

$(X + M)/PIB$ is the trade openness rate.

Based on this formula, we calculated for each MENA country of our sample the average value of economic vulnerability indicator during the period 1996- 2010.

Graph 1 show that the most vulnerable MENA countries are: Saudi Arabia, Kuwait, Oman and Algeria. These countries export basic products (petroleum and natural gas) and they depend largely on imports demand of this products and consequently on world price. This dependence makes them vulnerable and more exposed to terms of trade shocks.

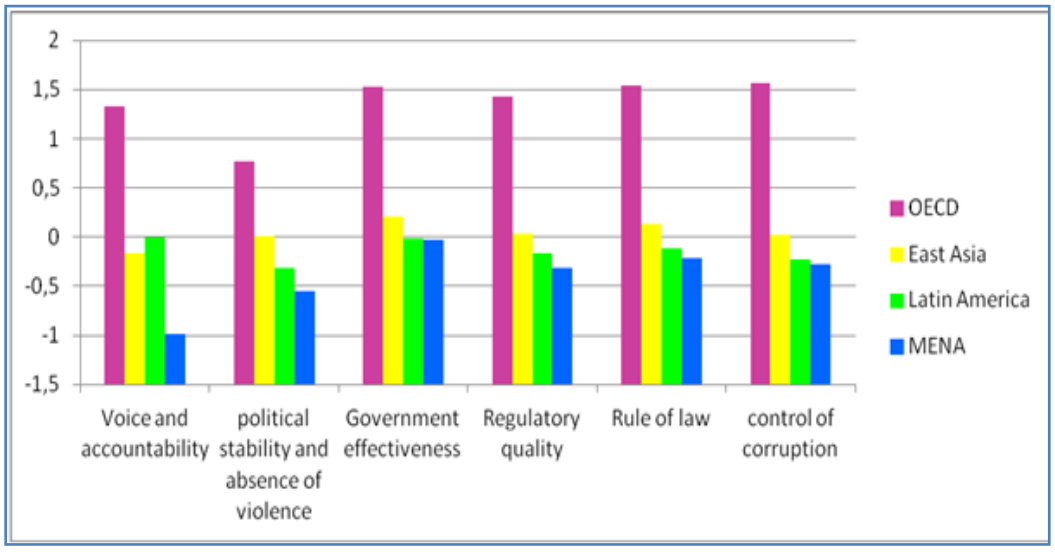
GRAPH 1. ECONOMIC VULNERABILITY DUE TO THE INSTABILITY OF TERMS OF TRADE IN MENA COUNTRIES OVER THE PERIOD 1996-2010



Source: Author's calculations, World Bank, World Development Indicators 2011.

2.3. Governance in MENA countries

GRAPH 2: GOVERNANCE IN THE MENA REGION COMPARED WITH OTHER REGIONS: GOVERNANCE INDICATORS FOR 2010



Source: Author's calculations, World Bank, Worldwide Governance indicators 2011.

Graph 2 above compares the level of governance in MENA region with regard to other regions. We notice a low institutional quality of MENA countries compared to other regions. According to the World Bank report (2003), the slow economic growth in the region results from the low level of governance: the simulation shows that compared to some successful countries of the South Asia, MENA countries could increase economic growth by 1% if they improve their public sector management. Given the low institutional quality of these countries and their vulnerability to trade shocks, can the implementation of good governance limit the negative effects of terms of trade instability generated by trade integrated process?

3. EMPIRICAL ANALYSIS: METHODOLOGY AND ESTIMATION RESULTS

This section tries to demonstrate if institutions can mitigate the negative effects of economic vulnerability on economic growth. It presents the model and outlines the measures and data used in this empirical study. It also interprets the estimation results.

3.1. Methodology and Model

In this subsection, we study the impact of economic vulnerability measured by terms of trade instability on economic growth. Taking into account institutional environment, we conduct a dynamic panel data for 15 MENA countries over the period 1996- 2010.

We utilize the generalized method of moments (GMM) estimation techniques. The consistency of the GMM estimator depends on the validity of the instruments. To address this issue, two specification tests are considered. The first is a Sargan test of over- identifying restrictions, which tests the overall validity of the instruments by analyzing the sample analog of the moment conditions used in the estimation process. The second test examines the hypothesis that the error term ε_{it} is not serially correlated.

We estimate the following model:

$$Y_{it} = C_0 + C_1.Y_{it-1} + C_2.Open_{i_t} + C_3.Vu\ln_{i_t} + C_4.X_{it} + C_5.I_{it} + \sigma_i + \varepsilon_{i_t} \qquad (1)$$

Where

Y_{it} is the real GDP growth rate of the country i at time t.

$Open$ is the trade openness rate of the country i at time t.

$Vu\ln_{it}$ is the economic vulnerability index which is measured by the standard deviation of terms of trade weighted by the ratio of trade openness of the country i.

X_{it} is a vector of control variables which are considered as determinants of economic growth in the literature.

- The level of initial GDP/ capita (in logarithm).
- Human capital proxied by primary school enrollment (in logarithm) (Ln HC).

Data of these macroeconomic variables are taken from the World Development indicators (2011).

I_{it} is a vector of institutional variables that includes six variables taken from Kaufman Institute dataset: Voice and accountability (VA), political stability and absence of violence (PS), government effectiveness (GE), Regulatory quality (RQ), Rule of law (RL) and Control of corruption (CC).

Data of these six institutional variables are obtained from the Worldwide Governance Indicators (2011). These variables vary from -2.5 to +2.5. (A value of -2.5 indicates that there's bad governance, and a value of +2.5 indicates that there's very good governance. Definitions of these variables are exposed in the appendix.

σ_i is a country specific effect

ε_{it} is an error term.

3.2. Estimation Results

In this section, we test in first time the ability of a shock of terms of trade to predict future economic growth, in an institutional environment. In a second time, we examine if trade openness can be a channel by which shocks of terms of trade are associated with economic growth in an institutional framework. To do it, we replace the vector of institutional variables (I_{i_t}) in the equation (1) by the interaction term between institutions and openness rate $(I * Open)$.

Table 1 below reports the results for 15 MENA countries, using GMM (sys) estimation. In all regressions, the Sargan and Hansen statistics indicate that we cannot reject the null hypothesis, H_0: Over-identifying restrictions are valid. So, the instrument variables used in the GMM estimation in our model are appropriate. The serial correlation tests point to first- but no second- order autocorrelation of the residuals, which is in accordance with the assumptions underlying the selection instruments.

In table 1, column 1 reports the results from the regressions of growth rates on shock of terms of trade. The coefficient of this last one has a negative and significant sign. This result is expected. Indeed, shocks of terms of trade contribute to fluctuations of economic growth. Greater exposure to external turbulence is associated with significant reductions in economic growth.

The estimation results also show that good institutional quality helps to mitigate the negative effects of economic vulnerability on economic growth. Indeed, by adding successively a one governance indicator, we find that the coefficients of vulnerability to external shocks decrease in absolute value. The introduction of governance indicators relieves the negative effect of shocks of terms of trade on economic growth. The effect of the institutional variables on economic growth is positive. Except for the indicator "Control of corruption" which has an insignificant sign, all the coefficients of governance indicators have a positive and significant sign.

- **Impact of shocks of terms of trade on economic growth: the role of mode of governance**

TABLE 1. TERMS OF TRADE SHOCKS, ECONOMIC GROWTH AND GOVERNANCE MODES: GMM ESTIMATION

Variables	***(1)***	***(2)***	***(3)***	***(4)***	***(5)***	***(6)***	***(7)***
		RQ	*VA*	*CC*	*RL*	*GE*	*PS*
yi_{t-1}	*0,018***	*0,459***	*0,110**	*0,502****	*0,145****	*0,24**	*0,203****
	(2,19)	*(2.60)*	*(1,88)*	*(3.76)*	*(3.18)*	*(2.07)*	*(5.08)*
$Vuln_{it}$	*-0,0018****	*-0,0012***	*-0,0015****	*- 0,0015***	*- 0,0015****	*-0,0013***	*-0,0006***
	(-4.09)	*(-2.38)*	*(-5,49)*	*(-2.04)*	*(-3.13)*	*(-2.80)*	*(-2.71)*
Open	*0,068****	*0,020*	*0,463****	*0,040****	*0,048****	*0,048****	*0,031***
	(8.23)	*(1.18)*	*(5,40)*	*(4.44)*	*(4.87)*	*(4.48)*	*(5,57)*
LnGDP/capita (t_0)	*0,019**	*-0,065****	*0,001*	*0,008*	*- 0,006*	*-0,02*	*-0,004***
	(1.79)	*(-3.53)*	*(0,50)*	*(0.71)*	*(-0.82)*	*(-1.21)*	*(-3.30)*
LnHC	*-0,213***	*0,100**	*-0,112****	*-0,17****	*-0,138****	*-0,147*	*- 0,113****
	(-2.69)	*(-1.87)*	*(-6,33)*	*(-3.48)*	*(-4.62)*	*(-1.41)*	*(-4.83)*
RQ		*0,065**					
		(1.92)					
VA			*0,026***				
			(2,46)				
CC				*0,002*			
				(0.22)			
RL					*0,034***		
					(2.44)		
GE						*0,060***	
						(2.40)	
PS							*0,023****
							(3,02)
Constant	*0,631***	*0,031*	*0,408****	*0,623***	*0,476****	*0,718****	*0,491****
	(20.73)	*(0.26)*	*(6,09)*	*(2.33)*	*(4,48)*	*(1.73)*	*(7.10)*
Observations	*175*	*137*	*137*	*137*	*136*	*137*	*137*
AR(1) P Value	*0.023*	*0.085*	*0,054*	*0.074*	*0,057*	*0.013*	*0.043*
AR(2) P Value	*0.547*	*0.209*	*0,465*	*0.260*	*0,314*	*0.154*	*0.407*
Sargan Test P Value	*0.715*	*0.989*	*0,810*	*0.881*	*0,596*	*0.374*	*0.158*

Hansen Test P Value	*0.495*	*0.889*	*0,419*	*0.575*	*0,512*	*0.960*	*0.815*

, **, * significant at 10%, 5% and 1% level. Student's t-test in parentheses.*

Table 2 reports estimation results of economic vulnerability on GDP growth rate, taking into account the interaction effect between trade openness and institutions. We use Arellano- Bond GMM estimation technique. The results of over- identification restriction tests (Sargan and Hansen tests) accept in all model equations the null hypothesis that instruments are valid. In addition, autocorrelation tests show no evidence of second order serial correlation in the residuals.

- **Impact of shocks of terms of trade on economic growth: the role of interaction terms between trade openness and mode of governance**

TABLE 2. IMPACT OF TERMS OF TRADE SHOCKS: THE ROLE OF INTERACTION TERMS BETWEEN OPENNESS AND INSTITUTIONS

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Open*RQ	Open* VA	Open* CC	Open* RL	Open* GE	Open* SP
y_{t-1}	0,361** (2.11)	0,138** (2.73)	0,171** (2.25)	0,157*** (3.24)	0,394* (2.14)	0,218** (4.80)
$Vuln_{it}$	-0,0012** (-2.49)	-0,0009** (-1.98)	-0,004*** (-4.42)	-0,0011** (-2.14)	-0,0013*** (-3.54)	-0,0004* (-1.84)
Open	0,02* (1.91)	0,02*** (4.13)	0,111*** (3.21)	0,019** (2.86)	0,03* (1.92)	0,010* (1.85)
LnGDP/capita (t_0)	-0,067*** (-3.53)	-0,001 (-0.39)	0,03 (1.90)	0,000 (0.06)	-0,041** (-2.94)	-0,058*** (-6.02)
LnHC	0,107* (1.88)	-0,062** (-3.28)	- 0,397** (-3.31)	-0,056*** (-3.94)	-0,057 (-0.64)	- 0,034 (-0,61)
Open*RQ	0,016* (2.05)					
Open* VA		0,009** (2.21)				
Open* CC			0,004 (0.56)			
Open* RL				0,001 (0.38)		
Open* GE					0,014** (2.25)	
Open* SP						0,003*** (3.40)
Constant	-0,02 (-0.18)	0,242** (2,37)	1,26** (2.63)	0,239*** (3.13)	0,528 (1.62)	0,306 (9.82)
Observations	137	137	137	136	137	137
AR(1) P Value	0.10	0,072	0.051	0.030	0.020	0.041

AR(2) P Value	0.242	0,516	0.715	0.231	0.148	0.298
Sargan test P Value	0.926	0,910	0.853	0.712	0.150	0.189
Hansen test P Value	0.702	0,342	0.740	0.142	0.553	0.568

*, **, *** significant at 10%, 5% and 1% level. Student's t-test in parentheses.

In table 2, estimation results indicate that economic vulnerability, in all regressions, has a negative and significant effect on economic growth even in the presence of interaction terms between trade openness and institutions. However, these interaction terms reduce the negative effects of economic vulnerability on economic growth. We conclude, from this analysis, that trade openness associated with good governance reduces the negative effects of trade shocks linked to terms of trade fluctuations. Trade liberalization is supposed to act directly on economic growth (the coefficient C_2) and indirectly by the institutional level (the coefficient C_6).

The total effect of trade openness is as follows:

Total effect of trade openness = $\left(C_2 + C_6.\bar{I}\right)Open_{it}$

Where

$\bar{I}$ is the average measure of institutional quality,

C_2 is the coefficient of trade openness,

C_6 is the coefficient of interaction term between trade openness and institutions,

Through the interaction effects between trade openness and institutions, we can measure the threshold of institutional development, from which trade openness has a positive effect on economic growth. We can determine from which level of institutional quality, trade openness is beneficial to economic growth in MENA countries. Trade openness can lead to a higher or lower level of economic growth in terms of institutional quality.

In order to measure the threshold effect, we suppose that the total effect of openness is positive:

$\left(C_2 + C_6.\bar{I}\right)Open_{it} \succ 0$

$C_2 + C_6.\bar{I} \succ 0$

Institutional quality threshold= $-C_2 / C_6$

We apply this formula to the three governance indicators, which the coefficient of interaction term with trade openness is significant. Results are summarized in table 3.

TABLE 3. TOTAL EFFECT OF A UNIT INCREASE IN TRADE OPENNESS ON ECONOMIC GROWTH AND THRESHOLD EFFECTS

Governance indicators	**Total effect of trade openness (A)**	**$\bar{I}$ (B)**	**Threshold effect (C)**
Regulatory quality	0,015	-0,315	-1,25
Government effectiveness	0,029	-0,026	-2,14
Voice and accountability	0,011	-0,980	-2,22

Source : Author's Computation.

In table 3, column (A) reports the total effect of a one unit increase in trade openness when the institutional variable is measured as the average value in the sample group (column (B)).
Column (C) indicates the threshold level of the institutional variable, over which trade openness has a positive impact on economic growth.
According to table 3, trade openness has a positive effect on economic growth from the threshold of the regulatory quality indicator (-1.25): from this value, any increase in the openness of a unit is accompanied by an increase in the economic growth of 0.015 if we use the average of this indicator (-0.315). Trade openness has a negative impact on economic growth under this threshold value.
For the indicator "government effectiveness", it is from the threshold of -2.14 that trade openness positively affects economic growth. Trade openness has a positive impact on economic growth from the threshold of -2.22, for the indicator "voice and accountability".

Conclusion

The findings presented here suggest in first time that economic vulnerability has a negative effect on economic growth and the implementation of good governance can mitigate the negative effect of these shocks on economic growth. In second time, the estimation results provide generally a positive sign of the coefficients of interaction terms (the interaction of trade openness with institutions), indicating that trade openness can stimulate economic growth but only when the threshold level of institutional development is reached.
Given the importance of good governance in easing trade shocks and its positive effects on economic growth, most MENA governments must undertake serious reforms at their institutions in order to achieve the path of strong and sustainable growth. According to Kaufman (2007), the more there is an adaptation of reform programs to the context and situation of each country, the more these economies have a chance of success.

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APPENDIX

I. List of MENA countries

1. Lebanon
2. Iran
3. Soudan
4. Kuwait
5. Saudi Arabia
6. Bahrain
7. Yemen
8. Oman
9. Mauritania
10. Syria
11. Jordan
12. Egypt
13. Algeria
14. Morocco
15. Tunisia

II. Institutional variables

1. Voice and Accountability (VA) – is the ability of country's citizens to participate in election, as well as freedom of expression, of association, etc.

2. Political Stability and Absence of Violence (PV) – measures the perception of the likelihood of government destabilization by unconstitutional or violent means.

3. Government Effectiveness (GE) –measures the perceptions of the government credibility and the quality of public and civil services and the degree of their independence from political pressures.

4. Regulatory Quality (RQ) – is the ability of the government to formulate and implement sound regulations that promote private sector development.

5. Rule of Law (RL) – measures the perceptions of agents' confidence in the rules of society, in particular the quality of contract enforcement and property rights.

6. Control of Corruption (CC) – measures the perceptions of the extent to which public power is exercised for private gain.