

## **Quantitative Evaluation of the Struggle of Economic Performance: The Case of MENA Countries**

*Noha Emar, Ph. D.*

Assistant Professor

Rutgers University

### **ABSTRACT:**

The recent political uprising in the Middle East and North African (MENA) economies shines the light on evaluating the so-called structural reforms that are aimed at achieving economic freedom. This paper examines the impact of liberal policies on the economic performance of labor and capital productivity in MENA economies. Using nonlinear Panel Least Squares regression with regional dummies and period fixed effects (LSDV) for a sample of 18 MENA countries over the period 1995-2009, the study estimates the impact of different aspects of economic freedom on labor and capital productivity. The economic freedom measure encompass different areas, including freedom of fiscal, monetary, trade, investment, labor, financial, and freedom from corruption. The results of the study suggest a non-uniform impact of different areas of economic freedom on output per worker, capital intensity, human capital per worker, or total factor productivity. For instance, while trade freedom, fiscal freedom, monetary freedom, investment freedom, financial freedom, and freedom from corruption enhances output per worker through the increase in human capital per worker, it worsens it through a negative impact on capital intensity and total factor productivity. Furthermore, the study finds a significant reverse causality that runs from enhancing either output per worker or its three components on the economic freedom measure. While increasing output per worker or human capital per worker is reflected in an improvement in economic freedom measures, the opposite is found for the increase in capital intensity or total factor productivity. An important policy implication in this respect suggests that liberal economic policies in MENA countries might not be a pre-requisite for their enhanced future productivity.

**Keywords:** MENA; Economic Freedom; Political Freedoms; Productivity; Corruption

**JEL Classification Numbers:** O16; O43; N20

## **I. INTRODUCTION**

Almost all of the MENA states suffer from fragile economic growth; a growth mostly based on revenues from natural resources and less based on sound economic performance. The main aim of the paper is to examine how economic freedom, if allowed in these countries, can affect output per worker. In addition, we take one step further and we explore how economic freedom can affect the three main components of output per worker, namely; capital intensities, human capital per worker, and total factor productivity.

The literature on the importance of strong institutions, either legal or financial, is rapidly growing. A leading paper of this literature is La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997) in which legal and financial institutions proved important for a firm's decisions. Within the same lines, Rodrik (1999) shows that countries with the sharpest drop in growth after 1975 had weak institutions, as measured by rule of law, democratic rights, and social safety nets. Similarly, Acemoglu et al. (2003) show that institutions have a more important effect on growth compared to economic policy. Once the institutions variable is included their regression, the coefficient of the macroeconomic policy turns insignificant. Easterly (2004) confirms these results. In contrast to Acemoglu et al. (2003) and Easterly (2004), in a cross section of 91 countries, Fatas and Mihov (2005) studied the effect of fiscal policy volatility, institutions, and growth. Their results showed that fiscal policy volatility has a significant negative impact on growth; in addition, they showed that institutions affect growth only through their effect on policy, particularly the policy's volatility.

In line with the results of Acemoglu et al. (2003) and Easterly (2004), using a panel data on hundred countries from 1975-1999, Veiga and Aisen (2006) find a positive association between greater fragmentation, polarization, and political instability as forms of market frictions and inflation volatility. Moreover, Veiga and Aisen find that forms of market frictions are the main determinants of inflation volatility. Finally, Alexandrakis and Livanis (2010) explore the impact of economic freedom on output per worker for Latin American countries. The results suggest that different areas of economic freedom have a non-uniform impact on economic performance. Small government and strong protection of property rights seem to be good for economic performance, while freedom to access the international market negatively impacts it.

Given the latest uprisings in many MENA countries, the main aim of the paper is to explore the extent to which the economic performance in these countries could be affected if their citizens were given the freedom to access international markets, the freedom to gain more control over their holdings of wealth, the freedom to enjoy a stable currency and market determined prices, the freedom to invest with limited obstacles to new and existing projects, the freedom to borrow from financial intermediaries, and the freedom from all sorts of corruption.

## II. EMPIRICAL SPECIFICATION

This section estimates the impact of different areas of economic freedom on output per capita in MENA states. Following Hall and Jones (1999) we estimate the natural logarithm of output per worker as given by the following equation

$$\ln y_{i,t} = \frac{\alpha}{1-\alpha} \ln k_{i,t} + \ln h_{i,t} + \ln A_{i,t}, \quad (1)$$

Where  $y_{i,t}$  stands for output per worker,  $k_{i,t}$  refers to the ratio of physical capital to output or capital intensity,  $h_{i,t}$  refers to human capital per worker,  $A_{i,t}$  refers to total factor productivity, and finally the subscript  $i$  and  $t$  refer to the country and the time period, respectively.

As equation (1) suggests, output per worker depends on three main determinants, physical capital, human capital, and productivity. Following Alexandrakis and Livanis (2010), this paper assesses the extent to which output per worker is affected by different areas of economic freedom such as trade freedom, monetary freedom, fiscal freedom, investment freedom, financial freedom, and freedom from corruption.

To perform this task, equation (2) below is estimated using Panel Least Square regression with regional dummies and period fixed effects (LSDV) for a sample of 18 MENA countries over the period 1995-2009.

$$\ln y_{i,t} = \beta_0 + \beta_1 EF_{i,t} + d_i + d_t + e_{i,t}, \quad (2)$$

Where  $EF_{i,t}$  stands for the economic freedom index for either one of the six different areas discussed above,  $d_i$  and  $d_t$  stand for the regional dummy and the period dummy, respectively, and finally  $e_{i,t}$  reflects all other factors affecting output per worker that are not included in the model or omitted variables.

To explore the channel through which economic freedom affects output per worker, the three independent variables of equation (1) are estimated;

$$\frac{\alpha}{1-\alpha} \ln k_{i,t} = \beta_0 + \beta_1 EF_{i,t} + d_i + d_t + u_{i,t}, \quad (3)$$

$$\ln h_{i,t} = \beta_0 + \beta_1 EF_{i,t} + d_i + d_t + v_{i,t}, \quad (4)$$

$$\ln A_{i,t} = \beta_0 + \beta_1 EF_{i,t} + d_i + d_t + w_{i,t}. \quad (5)$$

Where again  $EF_{i,t}$  stands for the economic freedom index for either one of the six different areas discussed above,  $d_i$  and  $d_t$  stand for the regional dummy and the period dummy, respectively, and finally  $u_{i,t}$ ,  $v_{i,t}$  and  $w_{i,t}$  reflects the omitted variables of each model.

### III. DATA

The data set consists of 18 MENA countries spanning the period 1995-2009. The data on output per worker is constructed from the data on GDP per capita (constant 2000 \$US) and labor force collected from the World Development Indicators World Bank database. The data on Economic Freedom measures are collected from the website of the Heritage Foundation database<sup>1</sup>. Next, data on the stock of capital is constructed from the domestic investment, a.k.a. gross capital formation (at constant prices) data compiled from the Penn World Tables. More specifically, using the perpetual inventory method and assuming that the capital equation is  $k_t = (1 - \delta)k_{t-1} + I_{t-1}$  where  $\delta$  stands for depreciation,  $I_{t-1}$  denotes the investment level of last period, and the initial level of capital is equal to  $k_0 = \frac{I_0}{g + \delta}$ . Following Hall and Jones (1999) and

Alexandrakis and Livanis (2010), the depreciation rate is assumed to be equal to six percent and following Bernanke and Gürkaynak (2001) and Alexandrakis and Livanis (2010),  $g$  is equal to the rate of growth of GDP during the decade in which investment is taken at the initial year.

Next, the data on human capital are collected from Barro and Lee (2000) as the average years of schooling, referring to educational attainment. Finally, following Alexandrakis and Livanis (2010), the data on productivity is constructed from the data of output per worker, human capital per worker, and capital intensity as follows,  $A_{i,t} = \frac{y_{i,t}}{h_{i,t}k_{i,t}^{\alpha/(1-\alpha)}}$  where  $\alpha$ , or the share of physical capital, is assumed to be equal to 0.33 following Mankiw, Romer, and Weil (1992).

### IV. ESTIMATION RESULTS

In this section, the coefficients of equation (2), (3), (4), and (5) are estimated and reported in Table (1). Each equation was estimated using LSDV and was repeated for each of the six measures of economic freedom, each one in turn. For sake of brevity, only the coefficients of the six measures of economic freedom are reported in the table.

As is obvious from Column (1), any improvement in any of the six measures of economic freedom, trade, fiscal, monetary, financial, investment, or corruption, enhances output per worker. The coefficients are all positive and statistically significant at the one percent level. This suggests that when the citizens of

---

<sup>1</sup> <http://www.heritage.org/index/explore>

MENA countries can be allowed more control over their disposition of their own wealth, when they enjoy a stable currency and market determined prices, open wide opportunities in front of new and existing businesses, when they can enjoy wide access to financial intermediaries, and when they suffer less from bribery and dishonesty, all will feed into a higher output per worker or higher standard of living in general.

Next, to explore the channel through which economic freedom feeds into output per worker, equations (3), (4), and (5) are estimated and reported in the table above. It was surprising to find that the six measures of economic freedom exert a negative and significant impact on capital intensity, as shown in Column (2). Similarly, Column (4) shows that the enhancement in economic freedom measures seems to reduce productivity in MENA countries. All coefficients are negative and statistically significant except for the impact of trade freedom on productivity. The result seems to surprisingly suggest that the less freedom in trade, fiscal, monetary, investment, financial, and corruption the more is either the capital intensity or the total factor productivity. The result seems surprising but is in line with the results of Alexandrakis and Livanis (2010).

**Table 1: Impact of Economic Freedom on Output/worker, Capital intensity, Human Capital/worker, and Productivity**

Regressors	Output per Worker regression (1)	Capital Intensity regression (2)	Human Capital per Worker regression (3)	Productivity Regression (4)
Trade Freedom	0.0218 (0.003)	-0.011 (0.003)	0.015 (0.003)	-0.014 (0.014)
No. Observations	239	239	219	203
$R^2$	0.32	0.06	0.22	0.01
Fiscal Freedom	0.008 (0.002)	-0.011 (0.002)	0.012 (0.002)	-0.04 (0.011)
No. Observations	239	239	219	203
$R^2$	0.17	0.10	0.24	0.05
Monetary Freedom	0.013 (0.003)	-0.022 (0.003)	0.014 (0.003)	-0.05 (0.013)
No. Observations	239	239	219	203
$R^2$	0.19	0.25	0.22	0.07
Investment Freedom	0.008 (0.002)	-0.009 (0.002)	0.008 (0.002)	-0.050 (0.011)
No. Observations	239	239	219	203
$R^2$	0.17	0.07	0.17	0.10
Financial Freedom	0.013 (0.002)	-0.011 (0.002)	0.01 (0.002)	-0.040 (0.011)
No. Observations	239	239	219	203
$R^2$	0.26	0.12	0.22	0.05
Freedom from Corruption	0.012 (0.002)	-0.018 (0.002)	0.013 (0.002)	-0.040 (0.010)
No. Observations	239	239	219	203
$R^2$	0.27	0.35	0.28	0.09

Notes: Estimation using LSDV. The numbers in parentheses are the standard errors.

Finally, it was interesting to find that all six measures of economic freedom increase human capital per worker. As shown in Column (4), all coefficients are positive and statistically significant. This result might suggest that the positive impact of the enhancement in economic freedom measures on output per worker arises mainly from their positive impact on human capital per worker. This positive impact seems to outweigh the negative impact of the enhancement of these measures on either capital intensity or total factor productivity.

The second part of the estimation procedure is related to reverse causality. The main question here is whether liberal economic policies are prerequisite or not for future economic productivity in the MENA region. To answer this question we estimate equations (2), (3), (4), and (5), but switch the dependent and the independent variables. For example, when estimating the reverse causality in equation (2), our dependent variable is the economic freedom index, and the dependent variable is output per worker. Each equation is estimated six times, and each time one of the economic freedom measures is taken as the dependent variable each one in a turn. The results show a significant reverse causality that runs from enhancing either output per worker or its three components on the economic freedom measure. While increasing output per worker or human capital per worker is reflected as an improvement in economic freedom measures, the opposite is found for the increase in capital intensity or total factor productivity. An important policy implication in this respect suggests that liberal economic policies in MENA countries might not be a prerequisite for their enhanced future productivity.

## **CONCLUSION**

Improvement in any of the six measures of economic freedom; trade, fiscal, monetary, financial, investment, or corruption enhances output per worker. When the citizens of MENA countries can be allowed more control over the disposition of their own wealth, when they enjoy a stable currency and market determined prices, open wide opportunities in front of new and existing businesses, when they can enjoy wide access to financial intermediaries, and when they suffer less from bribery and dishonesty, all will feed into higher output per worker or a higher standard of living in general.

In contrast to the results of Alexandrakis and Livanis (2010) and Blyde and Fernandez-Arias (2006), our results suggest that enhancing economic freedom in MENA states feeds into higher output per worker only through its impact on human capital per worker. Both the capital intensity channel and the total factor productivity channel do not seem to boost output per worker. Furthermore, our results show a significant reverse causality running from either output per worker, capital intensity, human capital per worker, or total factor productivity to economic freedom measures. An important policy implication in this respect suggests that liberal economic policies in MENA countries might not be a pre-requisite for their enhanced future productivity. In a future extension of this study, the model will be estimated with instrumental variables to check on the robustness of these results.

## REFERENCES

- Acemoglu, D., Johnson S., Robinson J., and Thaicharoen Y., 2003. Institutional Causes, Macroeconomic Symptoms: Volatility, Crises and Growth. *Journal of Monetary Economics* 50, 49–123.
- Alexandrakis, C. and Livanis, G., 2010. Economic Freedom and Economic Performance in Latin America: A Panel Data Analysis. (not published)
- Barro, R., Lee, J., 2000. International Data on Educational Attainment: Updates and Implications. CID Working Paper No. 42, April.
- Bernanke, B. S., and Gürkaynak, R. S. 2002. Is growth exogenous?. Taking Mankiw, Romer, and Weil Seriously. In *NBER Macroeconomics Annual 2001*, 16, 11-72
- Blyde, J. S., and Fernandez-Arias E., 2006. Why Does Latin America Grow More Slowly? In *Sources of Growth in Latin America: What Is Missing?* edited by Eduardo Fernandez-Arias, Rodolfo Manuelli, and Juan S. Blyde, 3-54. Washington, D.C.: Inter-American Development Bank.
- Easterly, W., 2004. National Policies and Economic Growth: A Reappraisal. mimeo NYU, available at <http://www.nyu.edu/fas/institute/dri/Easterly/File/national%20politics%20and%20economic%20growth.pdf>
- Fatás, A. and Mihov, I., 2005. Policy Volatility, Institutions and Economic Growth. CEPR Discussion Paper No. 5388.
- Hall, R. E. and Jones, C. I., 1999. Why Do Some Countries Produce so Much More Output Per Worker than Others?. *The Quarterly Journal of Economics*, 114(1), 83-116.
- Heritage Foundation, Economic Freedom Index <http://www.heritage.org/index/explore>
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and Vishny, R., 1998. Law and Finance. *Journal of Political Economy* 106, 113-1155.
- La Porta, R., Lopez-de-Silanes, F., and Shleifer, A., 2000. Government Ownership of Banks. NBER Working Paper no 7620.
- La Porta, R., Lopez-de-Silanes, F., Shleifer A., and Vishny, R., 1997. Legal Determinants of External Finance. *Journal of Finance* 52, 1131-1150.
- Mankiw, N. G., Romer, D., and Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth. *The Quarterly Journal of Economics*, 107(2), 407-437.
- Rodrik, D., 1999. Where Did All the Growth Go? External Shocks, Social Conflict, and Growth Collapses. *Journal of Economic Growth*, 4(4), December.
- Veiga, F., Aisen, A., 2006. Political instability and inflation volatility. NIPE WP 2, Universidade do Minho.