



Economic Freedom and Economic Performance: The Case MENA Countries

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Abstract: The recent political up-rise in the Middle East and North African (MENA) economies sparks the light on evaluating the so called structural reforms that aimed at achieving economic freedom. This paper examines the impact of liberal policies on output per worker in 139 countries with a case study on MENA economies. Using panel least square estimation with fixed effects for a sample of 139 countries over the period 1970-2008, the study estimates the impact of different aspects of economic freedom on output per worker and its components; physical capital, human capital, and productivity. The economic freedom measure encompasses different areas including the size of the government, the protection of property rights and enforcement of contracts, the access to sound money, the freedom to access international markets, and the laxness of regulation of credit, labor, and business. In line with the results of Alexandrakis and Livanis (2013), the study finds 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 does worsen 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.

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1. Introduction

The lack of economic growth in many countries, particularly the MENA countries, has been one of the most important economic problems, both historically and today. Over the past decades, the growth performance of the MENA region has been disappointing relative to the rest of developing countries, and the MENA states are attempting to achieve development and economic growth. A number of studies have consistently shown a positive relationship between economic freedom and economic growth rates across countries (Barro 1996; Justensen 2008). Hence, by becoming economically freer, these countries could theoretically achieve economic integration and macroeconomic convergence. The purpose of the present paper is to investigate precisely how economic freedom impact economic performance in these countries, defined by

four main measures – output per worker, capital intensity, human capital per workers and capital and labor productivity, and focusing on output per worker. Specifically, using panel data for 140 countries over the period 1970-2008, a Non Linear Panel Least Square regression is used to estimate the impact of the different components of economic freedom on three main components of output per worker – capital intensity, human capital per worker and total factor productivity.

In the growth literature, there have been extensive discussions on the importance of economic freedom on economic growth. A leading paper by Easton and Walker (1997) presents cross-sectional estimates on the relationship between economic freedom and growth. They find that changes in economic freedom have a significant impact on the steady-state level of income.

Similarly, De Haan and Sturm (2000), examined how robust economic freedom is related to economic growth; using both level and changes in economic freedom, they regress the average GDP on explanatory variables and an indicator of economic freedom during the period 1975-1990 for 80 countries. Their results show that changes in economic freedom are robustly correlated with economic growth, but not the level of economic freedom. In contrast, Dawson (2003) explored the causal relationship between economic freedom and growth, through Granger causality tests, found that the overall level of economic freedom causes growth. Le Roux and Gorchach (2011) results confirm the direction of the causality. VegaGordillo and Alvarez-Arce (2003) also confirm these results. They find a positive relationship between economic, political freedom and growth, but no statistically significant causality from growth to economic freedom. They shed some additional lights on the link between economic and political freedom: economic freedom enhances political freedom more than democratic institutions enhance economic freedom. Their results suggest that both political and economic freedom foster economic growth. In addition, Justensen (2008) investigates the causal relationship between economic freedom and economic growth further, considering both direct and indirect effects through the investment channel. He runs Granger causality tests for both an aggregated measure of economic freedom (Fraser Institute, 2015) as well as its individual components using panel data for the period 1970-1999 and investment as the dependent variable, and finds that economic freedom causes economic growth through the investment channel. In all the studies which considered, the author did not find any statistically significant causality from growth to economic freedom. Cebula (2011) goes further by investigating what specific types of economic freedom measures are important for growth. He investigates the impact of 10 forms of economic freedom (as developed by the Heritage Foundation) on economic growth in OECD nations, and found that economic growth is positively correlated with several forms of economic freedom: monetary, business, investment, labor, fiscal, property rights freedoms and freedom from corruption. Regarding the size of the coefficients, a one-unit increase in the fiscal freedom index increase the growth rate by 1.01%, and an increase of one-unit in the business freedom index raises economic growth by 1.09%. Freedom from corruption has also quite a high coefficient of 0.8, the lowest being for the labor freedom index (0.42). Investment freedom and corruption freedom have the same effect on economic growth. According to Dawson's (2003),

both bivariate and multivariate tests for causality yield similar results, but in contrast, he found some bidirectional causal effects of the size of the government on economic growth that other authors did not find. He did not reach any conclusion on the direction of the causality between growth and came to the conclusion that money and price stability is endogenously determined with growth. Within the same lines, Carlsson and Lundström (2002) analyze the effects of each component of economic freedom in growth regressions using observation for 74 countries, over a period of 25 years. They find that some areas of freedom have a significant and sizeable effect on the growth of GDP, considering the sensitivity test suggested by Sala-i-Martin (1997), while some of the categories in the index are insignificant or significant but negatively correlated (such as financial freedom or freedom of trade). Consequently, this does not mean that increasing economic freedom, in general, is good for economic growth since, among the components of economic freedom, some having a counteracting impact on economic activity.

Heckelman and Stroup (2000), disaggregating the specific components and measuring their independent impact, came to the same conclusion. Running multivariate regressions with growth as the dependent variable against the different categories of the index of freedom (money and inflation, takings and discriminatory taxes, government operations and regulations, restraints on international trade), their analysis suggests that only 3 of the 14 components have an independent contributing effect on growth. Ultimately derived an empirically weighted summary index of growth-promoting economic freedoms.

In a similar way, this paper pursues the goal to uncover which part of economic freedom impacts (hinder or helps) Total Factor Productivity Growth (TFPG), using the Fraser Institute Index of Economic Freedom. This is a strand of the literature that has yet to be explored. Makdisi, Fattah, and Liman (2003) started to explore this area by studying the contribution of total factor productivity (TFP) to economic growth in the MENA countries. They found that only Egypt, Morocco, Tunisia and Turkey had positive TFPG; regressing TFPG on relevant variables such as institutions, inflation rate, initial income and initial enrollment in primary school, they found that institutions and the stock of human capital affect positively the TFPG, while the negative sign of the coefficient for initial income points to the existence of catching up effect at the TFPG level. The impact of economic freedom on TFPG remains yet to be studied, which is one of the aims of this paper. Policy-makers will benefit from focusing their

attention on those specific components of economic freedom that do contribute to economic performance, through their impact on output per worker and its different components. The structure of the paper is as follows. In the next section, the author lays out empirical specification. Section 3 describes the data set. Section 4 describes the empirical results, and the last section concludes.

2. Empirical Specification

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

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

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

Following Alexandrakis and Livanis (2013), output per worker is expected to be affected either directly or indirectly, by different areas of economic freedom such as the size of the government, the protection of property rights and enforcement of contracts, the access to sound money, the freedom to access international markets, and the laxness of regulation of credit, labor, and business. To examine this relationship, equation (2) estimates the direct effect of economic freedom on output per worker using Panel Least Square regression with regional dummies and period fixed effects (LSDV) for a sample of 139 countries over the period 1970-2008. The period of the study is divided into eight-five-years periods, where the last year contains only four years.

$$(2) \ln y_{i,t} = \beta_0 + \sum_{j=1}^5 \beta_j EF_{j,i,t-v} + d_i + d_t + e_{i,t}$$

Where $\ln y_{i,t}$ stands for the average over v period output per worker and $EF_{i,t-v}$ represents the economic freedom chain-linked overall index and its five components, each one in a turn at the beginning of the v years period, where v is equal to five years.

Next, the variables d_i and d_t stands 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 indirectly affects output per worker, the three independent variables of the equation (1) are estimated as follows;

$$(3) \frac{\alpha}{1-\alpha} \ln k_{i,t} = \beta_0 + \sum_{j=1}^5 \beta_j EF_{j,i,t-v} + d_i + d_t + u_{i,t}$$

$$(4) \ln h_{i,t} = \beta_0 + \sum_{j=1}^5 \beta_j EF_{j,i,t-v} + d_i + d_t + v_{i,t}$$

$$(5) \ln A_{i,t} = \beta_0 + \sum_{j=1}^5 \beta_j EF_{j,i,t-v} + d_i + d_t + w_{i,t}$$

Where $\ln k_{i,t}$, $\ln h_{i,t}$, and $\ln A_{i,t}$ are defined as the average of the v period physical capital to output, human capital per worker, and total factor productivity respectively. The variables $u_{i,t}$, $v_{i,t}$ and $w_{i,t}$ reflects the omitted variables of each model, and $EF_{i,t}$, d_i and d_t are defined in Equation (2) above.

3. Data

The data set consist of 139 countries spanning the period 1970-2008. The dataset was averaged into eight five years periods where the last period has only four years. 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 the Economic Freedom Index measures, are collected from the website of the Fraser Institute (2015). In addition to the chain-linked overall index, the author uses its five components covering five main policy areas: the size of the government, the protection of property rights and enforcement of contracts, the access to sound money, the freedom to access international markets, and the laxness of regulation of credit, labor, and business.

Next, data on stock of capital is constructed from the domestic investment, as known as 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 as follows;

$k_t = (1 - \delta)k_{t-1} + I_{t-1}$ where δ stands for depreciation and I_{t-1} denotes investment level of last period. Where the initial level of capital is equal to

$k_0 = \frac{I_0}{g + \delta}$. Following Hall and Jones (1999) and Alexandrakis and Livanis (2013), the depreciation rate is assumed equal to six percent and following Bernanke and Gurkayanak (2001) and Alexandrakis and Livanis (2013), 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 (2013), the data on productivity is constructed from the data of output per worker, human capital per worker, and

capital intensity as follows $A_{i,t} = \frac{y_{i,t}}{h_{i,t}k_{i,t}^{\alpha}}$ where α , or the share of physical capital, is assumed to be equal to 0.33 following Mankiw (1992).

4. 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 a turn. For seek of brevity, only the coefficients of the five measures of economic freedom are reported in the table.

As obvious from Column (1), any improvement in any of the five measures of economic freedom; the size of the government, the protection of property rights and enforcement of contracts, the access to sound money, the freedom to access international markets, and the laxness of regulation of credit, labor, and business. *** The coefficients are all positively and statistically significant at the one percent. This suggests that when the citizens of MENA countries can be allowed more control on 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 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, exerts 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 results seem 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 results seem surprising, but in line with the results of Alexandrakis and Livanis (2013).

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 out-weigh 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 the reverse causality. The main question here is whether liberal economic policies are pre-requisite or not for future economic productivity in the MENA region. To answer this question, the author estimates equations (2), (3), (4), and (5) but with switching the dependent and the independent variables. For example, when estimating the reverse causality of in equation (2), dependent variable is the economic freedom index and the dependent variable is output per worker. Each equation is estimated six times with 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 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.

5. 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 on 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 higher output per worker or higher standard of living in general.

In contrast to the results of Alexandrakis and Livanis (2013) and Bylde and Fernandez-Arias (2006), the results of this study 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, the results of the current study 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.

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Appendix

Figure 1. MENA Region Economic Freedom Index, 2008

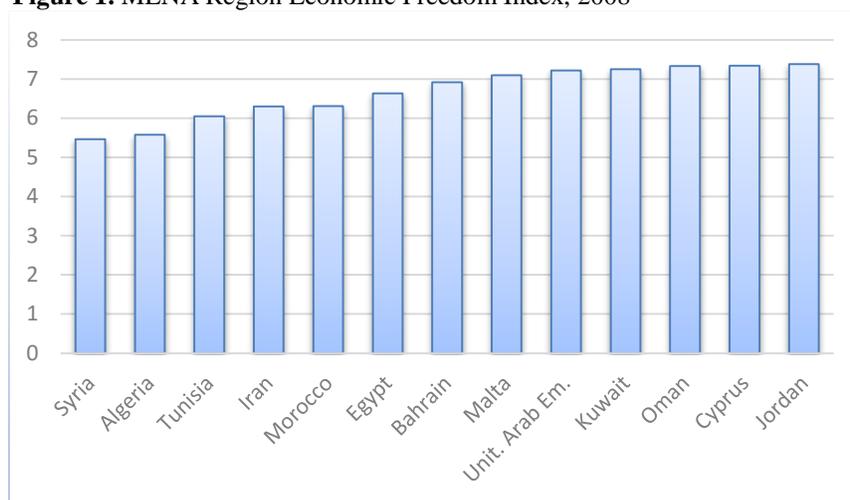


Table 2: The Effect of Economic Freedom on Output per Worker and its Components using Panel Fixed Effects Regression.

Regressors	All Countries				MENA & the Rest of the World			
	(1)	(2)	(3)	(4)	(1')	(2')	(3')	(4')
	Output per Worker regression	Capital Intensity regression	Human Capital per Worker regression	Productivity Regression	Output per Worker regression	Capital Intensity regression	Human Capital per Worker regression	Productivity Regression
<i>EF</i>	0.604***	-0.309***	-0.099	0.993***	0.647***	-0.309***	-0.054	1.025***
<i>EF*MENA</i>	-	-	-	-	-0.747**	-0.080	-0.628*	-1.094***
Overall R^2	0.310	0.130	0.0004	0.141	0.04	0.128	0.025	0.083
Within R^2	0.166	0.159	0.129	0.383	0.174	0.160	0.144	0.388
# Observations	658	598	637	474	658	598	637	474
# Countries	119	96	113	89	119	96	113	89
F(df, n)	17.67***	12.01***	6.40***	20.53***	9.84***	10.92***	5.88***	23.09***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 3: *The effect of Economic Freedom Indices on Output per Worker using Panel Fixed Effects Regression.*

	All Countries	MENA & the other Countries
Regressors: Output per Worker relative to USA	(1)	(2)
EF1	-	-
EF2	-	0.252**
EF3	0.183***	0.162**
EF4	-	-
EF5	-	-
EF1*MENA	-	-
EF2*MENA	-	-
EF3*MENA	-	-
EF4*MENA	-	-
EF5*MENA	-	-
Overall R^2	0.307	0.214
Within R^2	0.150	0.162
# Observations	592	592
# Countries	118	118
F(df, n)	5.87	4.73***

** $p < 0.01$; *** $p < 0.001$.

Table 4: *The effect of Economic Freedom Indices on Output per Worker through Capital using Panel Fixed Effects Regression.*

	All countries	MENA & the other Countries
Regressors		
Capital Intensity	(1)	(2)
EF1	-0.055*	-
EF2	-0.216***	-0.216***
EF3	-	-
EF4	-0.097**	-0.106**
EF5	-	-
EF1*MENA	-	-
EF2*MENA	-	-
EF3*MENA	-	-
EF4*MENA	-	-
EF5*MENA	-	-
Overall R^2	0.212	0.186
Within R^2	0.153	0.157
# Observations	516	516
# Countries	95	95
F(df, n)	5.81***	79349***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 5: *The effect of Economic Freedom Indices on Output per Worker through Human Capital using Panel Fixed Effects Regression.*

	All Countries	MENA & the other Countries
Regressors	(2)	(1)
EF1	-	-
EF2	-0.186*	-
EF3	-	-
EF4	-	-
EF5	-	-
EF1*MENA	-	-
EF2*MENA	-	-
EF3*MENA	-	-
EF4*MENA	-	-
EF5*MENA	-	-
Overall R^2	0.005	0.024
Within R^2	0.126	0.133
# Observations	569	569
# Countries	112	112
F(df, n)	2.53***	2.05**

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 6: *The effect of Economic Freedom Indices on Output per Worker through Productivity using Panel Fixed Effects Regression.*

	All Countries	MENA & the other Countries
Regressors	(1)	(1)
EF1	-	-
EF2	0.812***	0.963***
EF3	0.317**	0.278**
EF4	-	-
EF5	-	-
EF1*MENA	-	-
EF2*MENA	-	-0.772**
EF3*MENA	-	-
EF4*MENA	-	-
EF5*MENA	-	-
Overall R^2	0.284	0.245
Within R^2	0.365	0.381
# Observations	437	437
# Countries	88	88
F(df, n)	10***	-

** $p < 0.01$; *** $p < 0.001$



Robustness Check using Prais-Winsten Regression procedure, Panel-Corrected Standard Errors, and Autoregressive errors

Table 7: *The Effect of Economic Freedom on Output per Worker and its Components using Prais-Winsten regression procedure, panel-corrected standard errors, and autoregressive errors.*

Regressors	All Countries				MENA & the Rest of the World			
	(1) Output per Worker regression	(2) Capital Intensity regression	(3) Human Capital per Worker regression	(4) Productivity Regression	(1') Output per Worker regression	(2') Capital Intensity regression	(3') Human Capital per Worker regression	(4') Productivity Regression
EF	0.577***	-0.134***	-	1.133***	0.622***	-0.132***	-	1.153***
EF*MENA	-	-	-	-	-0.585**	-	-	-0.619*
R^2	0.070	0.215	0.456	0.142	0.076	0.216	0.456	0.143
# Observations	539	598	637	385	539	598	637	385
# Countries	119	96	113	89	119	96	113	89
F(df, n)	62.85***	8.88***	0.00	42.60***	32.66***	4.48**	0.32	21.27***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$



Table 8: *The effect of Economic Freedom Indices on Output per Worker using Prais-Winsten regression procedure, panel-corrected standard errors, and autoregressive errors.*

	All Countries	MENA & the other Countries
Regressors:	(1)	(2)
EF1	0.087**	0.095**
EF2	0.151***	0.199***
EF3	0.102***	0.097**
EF4	-	-
EF5	0.246**	0.229*
EF1*MENA	-	-0.153*
EF2*MENA	-	-0.265***
EF3*MENA	-	-
EF4*MENA	-	-
EF5*MENA	-	-
R^2	0.092	0.106
# Observations	474	474
# Countries	118	118
F(df, n)	10.21	5.90

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$



Table 9: *The effect of Economic Freedom Indices on Output per Worker through Capital using Prais-Winsten regression procedure, panel-corrected standard errors, and autoregressive errors.*

	All countries	MENA & the other Countries
Regressors	(1)	(2)
EF1	-0.065***	-0.062***
EF2	-0.080***	-0.090***
EF3	-	-
EF4	-	-
EF5	-	-
EF1*MENA	-	-0.186*
EF2*MENA	-	0.145**
EF3*MENA	-	-
EF4*MENA	-	-0.131*
EF5*MENA	-	-
R^2	0.264	0.266
# Observations	516	516
# Countries	95	95
F(df, n)	5.32***	471***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$



Table 10: *The effect of Economic Freedom Indices on Output per Worker through Human Capital using Prais-Winsten regression procedure, panel-corrected standard errors, and autoregressive errors.*

	All Countries	MENA & the other Countries
Regressors	(1)	(2)
EF1	-0.055**	0.057*
EF2	-	-0.091*
EF3	-	-
EF4	0.117***	0.145***
EF5	0.151**	0.130**
EF1*MENA	-	-
EF2*MENA	-	-
EF3*MENA	-	-
EF4*MENA	-	-0.415**
EF5*MENA	-	-
R^2	0.498	0.50
# Observations	569	569
# Countries	112	112
F(df, n)	3.77***	2.98***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$



Table 11: The effect of Economic Freedom Indices on Output per Worker through Productivity using Prais-Winsten regression procedure, panel-corrected standard errors, and autoregressive errors

	All Countries	MENA & the other Countries
Regressors	(1)	(2)
EF1	0.142*	0.141**
EF2	0.572***	0.641***
EF3	0.154*	0.143*
EF4	-	-
EF5	-	-
EF1*MENA	-	-
EF2*MENA	-	-0.853***
EF3*MENA	-	-0.292***
EF4*MENA	-	-
EF5*MENA	-	-
R^2	0.148	-
# Observations	349	349
# Countries	88	88
F(df, n)	9.84***	-

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$