

# How Democracy Affects Economic Growth: Evidence from MENA Region (1990-2015)

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## **Estimating the indirect effect of democracy on economic growth in MENA countries over the period (1990 - 2015)**

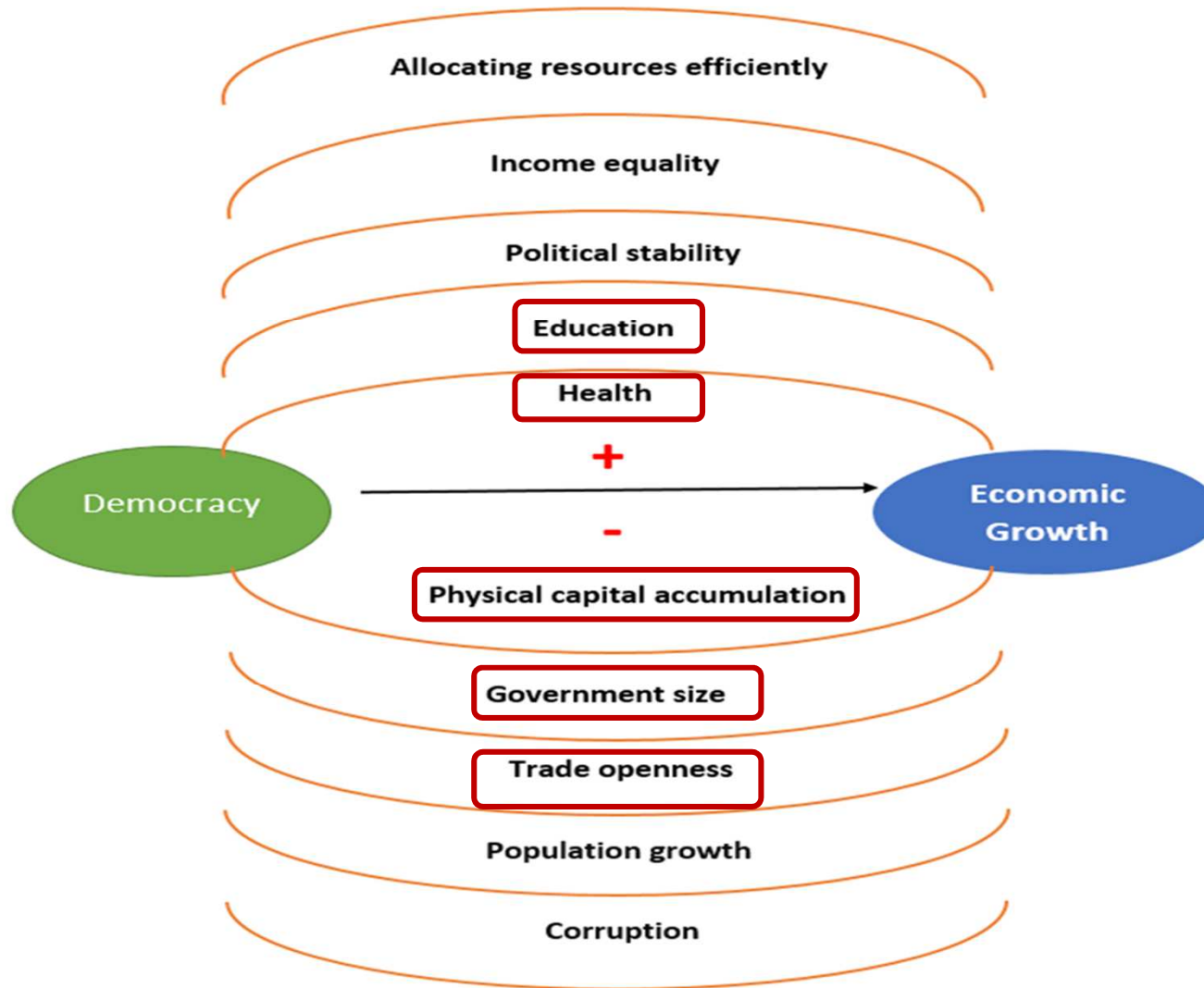
### Research hypotheses:

**H1:** democracy affects economic growth significantly through various channel variables.

**H2:** the indirect effect of democracy on growth differs in different democratic groups of countries within the MENA region.

**H3:** the indirect effect of democracy on growth is affected by the standards of living in the MENA countries.

**H4:** the indirect effect of democracy on growth is stimulated by the Arab spring revolution.



**Panel data:  $N = 1, 2, 3, \dots, 17$  MENA Countries  
 $T = 1, 2, \dots, 26$  Years (1990 - 2015).**

**Equations: 6 Equations, for 6 Endogenous Variables**

# Dependent Variables

<b>Variable</b>	<b>Measurement</b>
Economic growth (GDPP)	GDP per capita
Health (HEAL)	Mortality rate, infant (per 1,000 live births)
Education (EDUS)	Education, School enrollment, secondary (% gross).
Physical capital (GCF)/ per labor	Gross capital formation includes land improvements; plant, machinery, and equipment purchases; and the construction of roads, railways, schools, offices, hospitals, commercial and industrial buildings, relative to number of labor.
Government size (GZ)	Government final consumption expenditure includes all government current expenditures for purchases of goods and services, expenditures on national defense and security relative to GDP.
Trade openness (TR)	Imports and exports relative to GDP

Variable	Measurement
Democracy (DEM)	Varieties of democracy (V-DEM) index, Electoral democracy index (freedom of expression index, Freedom of association index, Clean elections index).
Primary Education (EDUP)	Education, School enrollment, primary (% gross).
Female primary education (EDUPF)	School enrollment, primary, female (% gross)
Exchange rate (EX)	Official exchange rate (LCU per US\$, period average)
Population growth (POPG)	Population growth (annual %)
Urban population (UPOP)	Urban population (% of total)
Share of population (POP1)	Population ages 0-14 (% of total)
Share of population (POP2)	Population ages 65 and above (% of total)
Corruption Index (CO)	Corruption Index (V-DEM index)
Unemployment (UM)	Unemployment, total (% of total labor force)
Inflation (INF)	INF: Inflation, consumer prices (annual %)
Land area (LA)	Land area (sq. km)
Oil producing countries (Dummy)	If the oil production is more than one million barrels per day=1, 0 otherwise

$$\ln GDPP_{it} = \gamma_0 + \gamma_1 \ln HEA_{it} + \gamma_2 \ln EDU_{it} + \gamma_3 \ln GCF_{it} + \gamma_4 \ln GZ_{it} + \gamma_5 \ln TR_{it} + u_{it} \dots \dots \dots (1)$$

$$\ln HEA_{it} = \beta_0 + \beta_1 \ln GDPP_{it} + \beta_2 EDEM_{it} + \beta_3 \ln PRIF_{it} + u_{it} \dots \dots \dots (2)$$

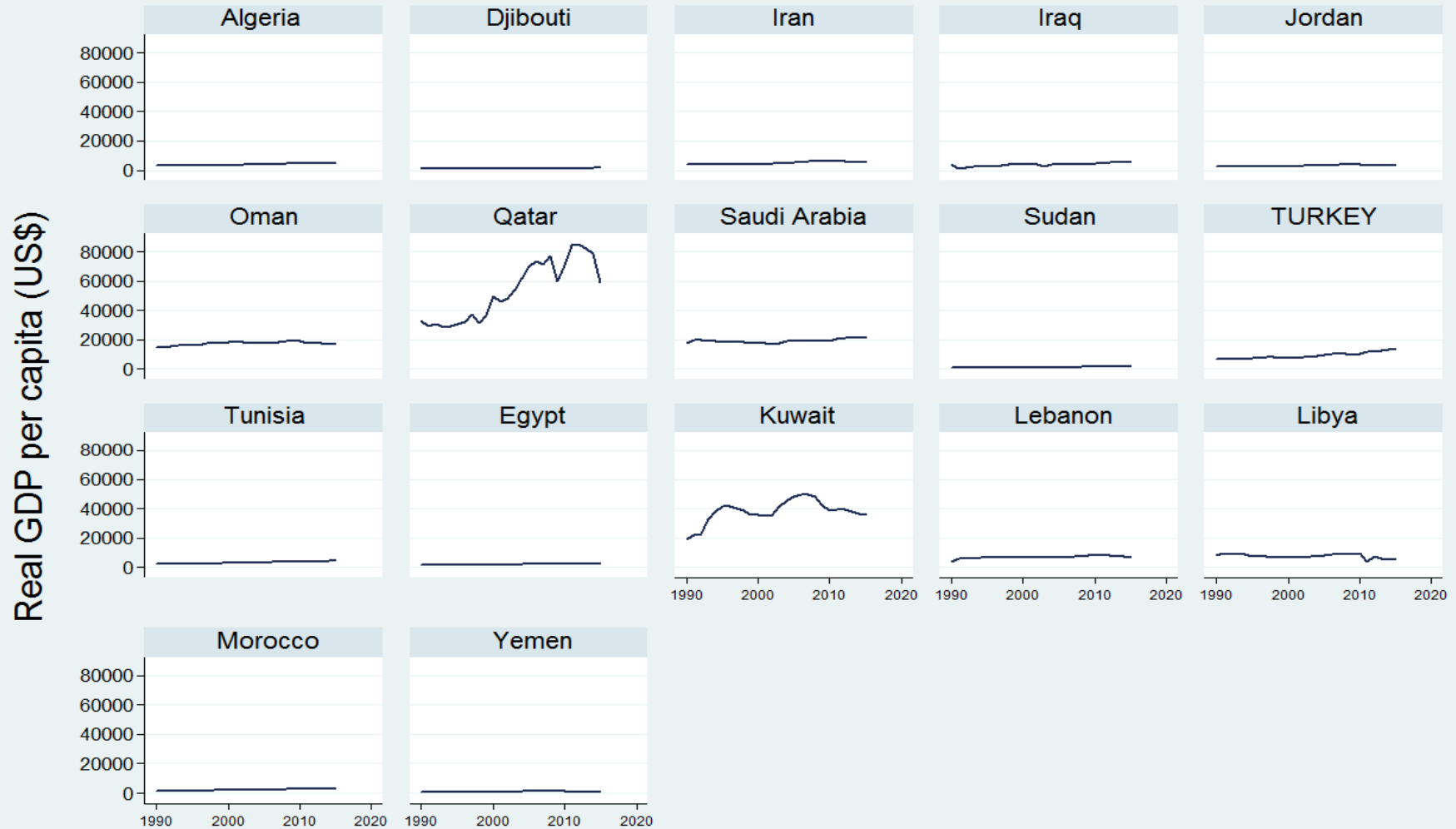
$$\ln EDU_{it} = \beta_0 + \beta_1 \ln GDPP_{it} + \beta_2 EDEM_{it} + \beta_3 \ln PRI_{it} + \beta_4 \ln HEA_{it} + u_{it} \dots \dots \dots (3)$$

$$\begin{aligned} \ln GCF_{it} \\ = \beta_0 + \beta_1 \ln GDPP_{it} + \beta_2 EDEM_{it} + \beta_3 \ln EX_{it} + \beta_4 \ln UPOP_{it} + \beta_5 \ln UM_{it} + \beta_6 \ln EDU_{it} + u_{it} \dots \dots \dots (4) \end{aligned}$$

$$\begin{aligned} \ln GZ_{it} \\ = \beta_0 + \beta_1 \ln GDPP_{it} + \beta_2 EDEM_{it} + \beta_3 \ln POPG_{it} + \beta_4 \ln TR_{it} + \beta_5 \ln CO_{it} + u_{it} \dots \dots \dots (5) \end{aligned}$$

$$\begin{aligned} \ln TR_{it} \\ = \beta_0 + \beta_1 \ln GDPP_{it} + \beta_2 EDEM_{it} + \beta_3 \ln UPOP_{it} + \beta_4 \ln INF_{it} + \beta_5 \ln LA_{it} + u_{it} \dots \dots \dots (6) \end{aligned}$$

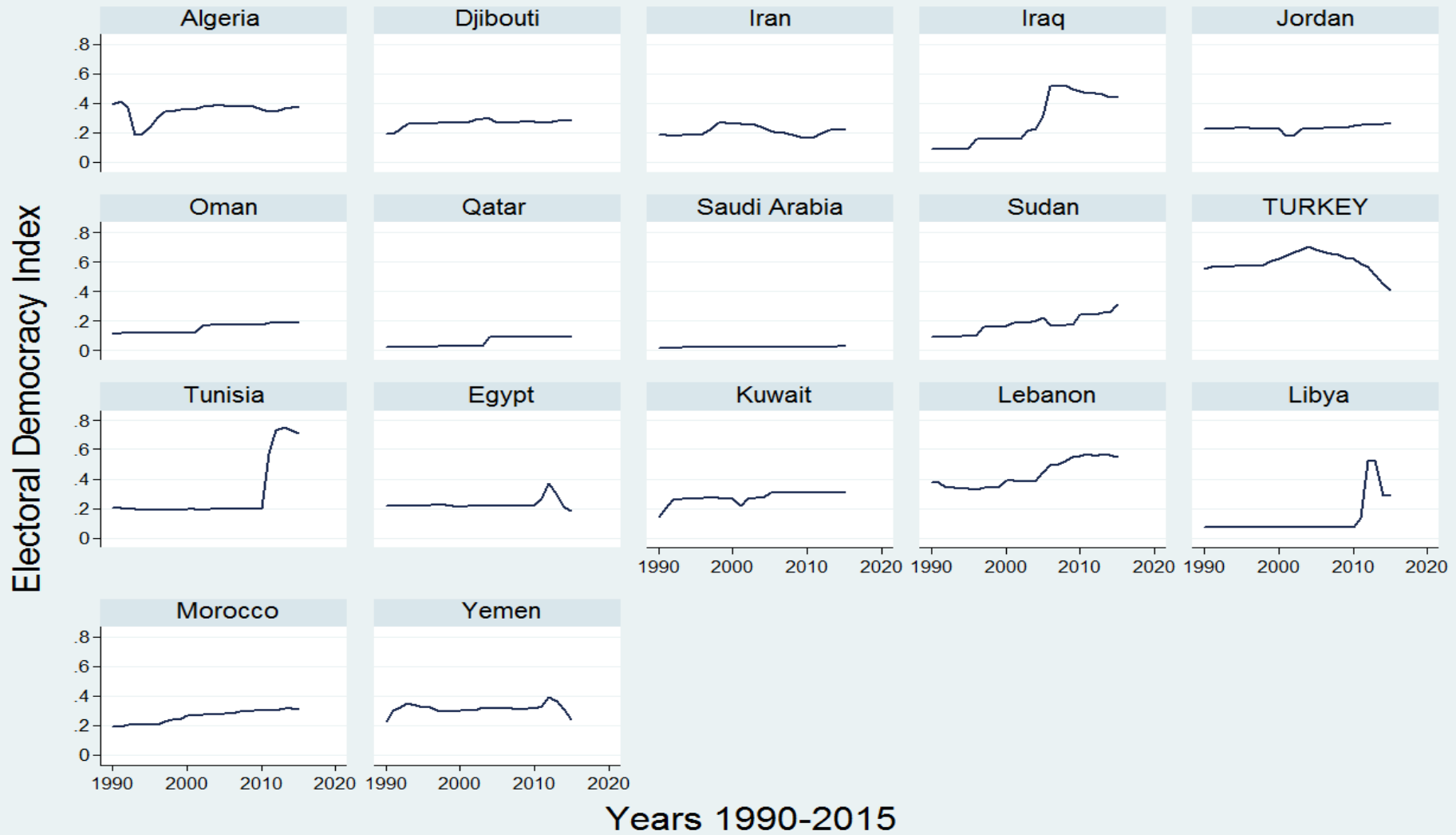
# GDP per capita in MENA region



Years 1990-2015

GDP per capita by Country





Electoral Democracy Index by Country

# Estimated Models of the MENA Countries

Stages of Political Democracy						Standards of living	
V-DEM Institute		Freedom house		Classification based on EDEM index (1990-2015)		Average per capita income(\$)	
Electoral Democracy & electoral autocracy	Closed autocracy	Free & partly free	Not free	Democratic countries	Autocratic countries	Poor countries	Rich Countries
Algeria Djibouti Egypt Iran Iraq Lebanon Tunisia Turkey	Jordan Kuwait Libya Morocco Oman Qatar Saudi Arabia Yemen	Kuwait Lebanon Morocco Tunisia Turkey	Algeria Djibouti Egypt Iran Iraq Jordan Libya Oman Qatar Saudi Arabia Sudan Yemen	Algeria Djibouti Iraq Kuwait Lebanon Tunisia Turkey Morocco Yemen	Egypt Iran Jordan Libya Oman Qatar Saudi Arabia Sudan	Algeria Djibouti Egypt Iraq Jordan Morocco Sudan Tunisia Yemen	Iran Kuwait Lebanon Libya Oman Qatar Saudi Arabia Turkey

Simultaneous equations approach in a system of six equations are estimated jointly using 3SLS.

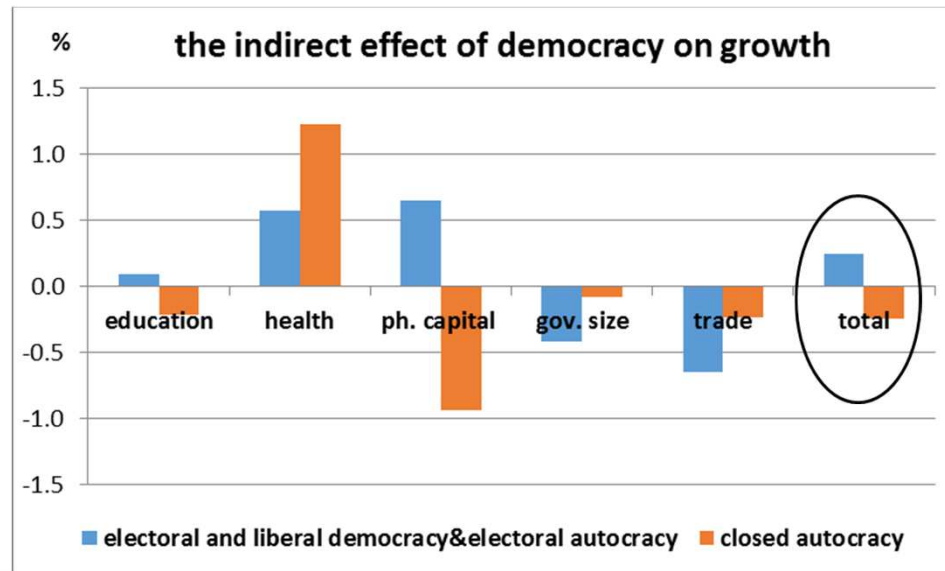
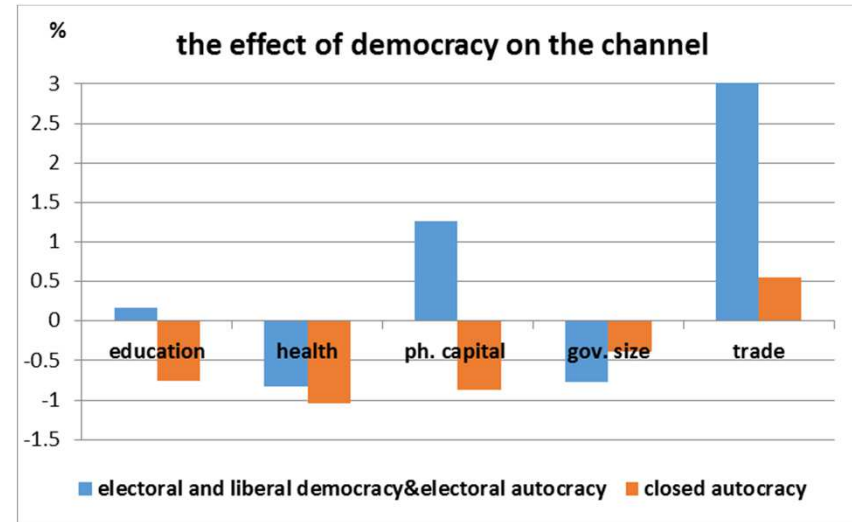
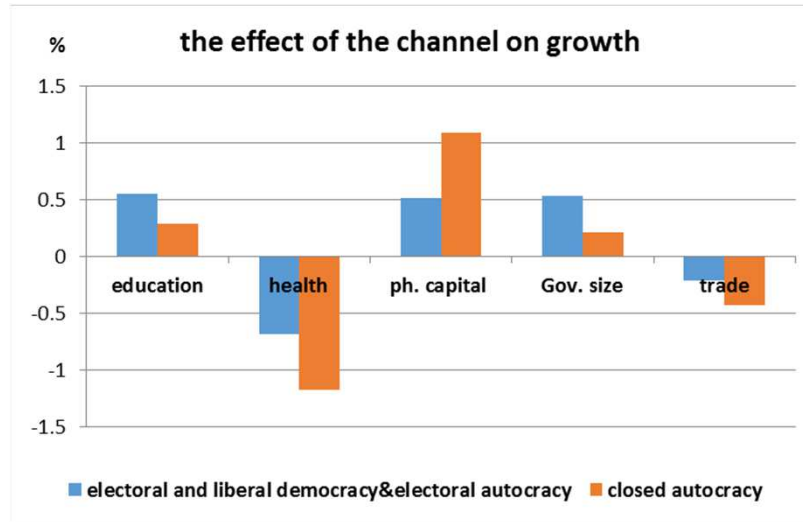
2SLS: It is consistent even if the explanatory variables are endogenous.

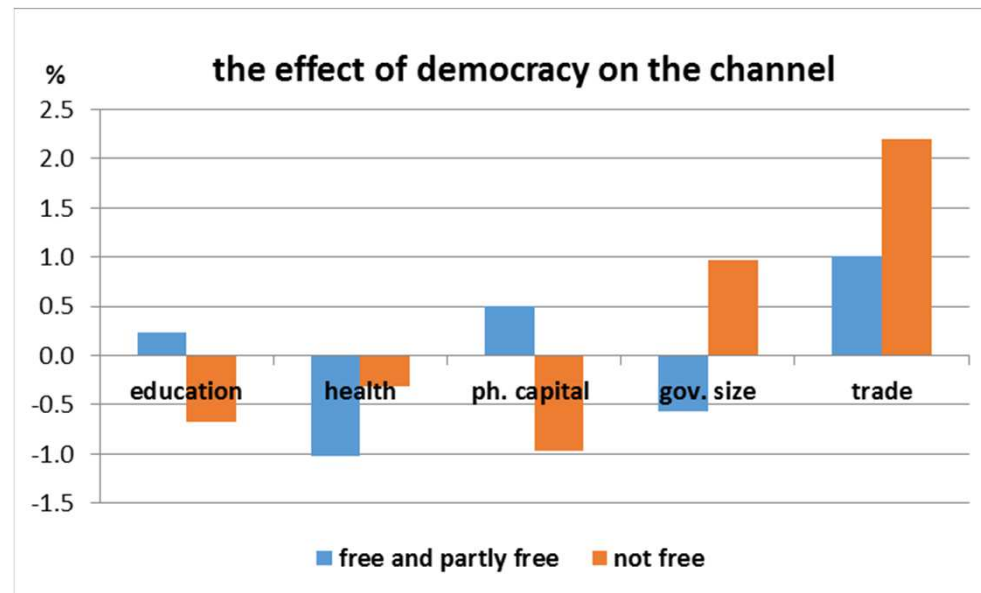
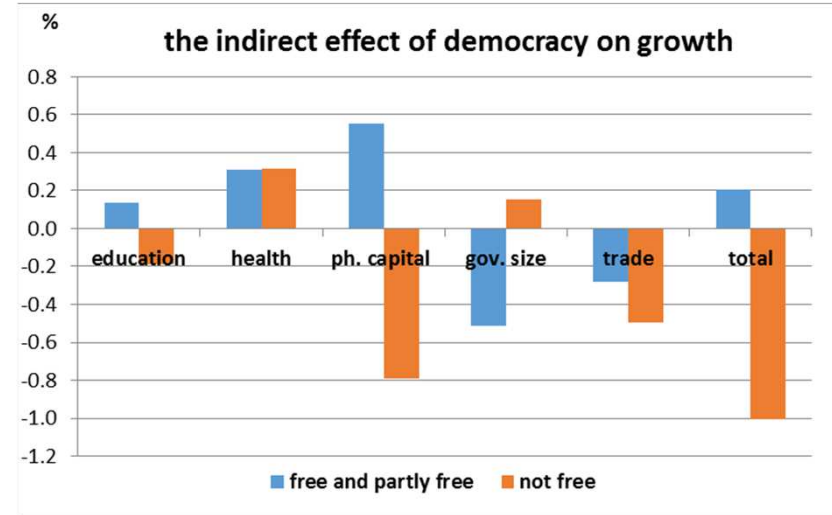
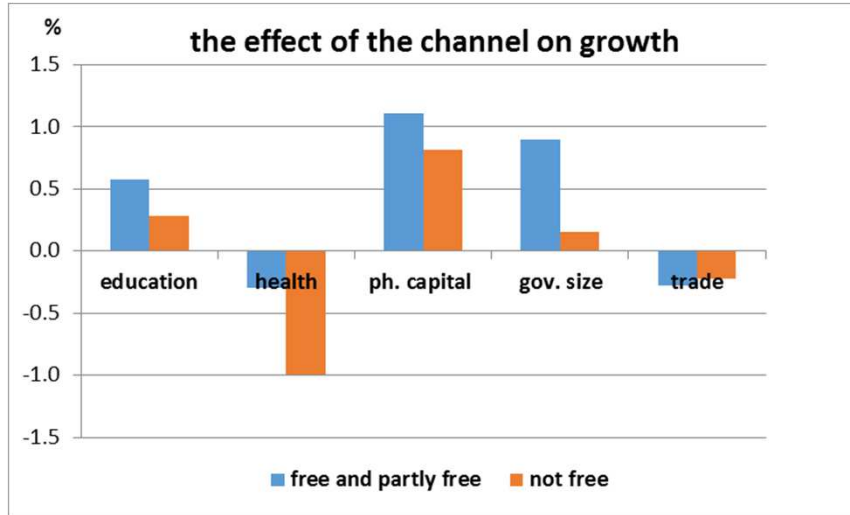
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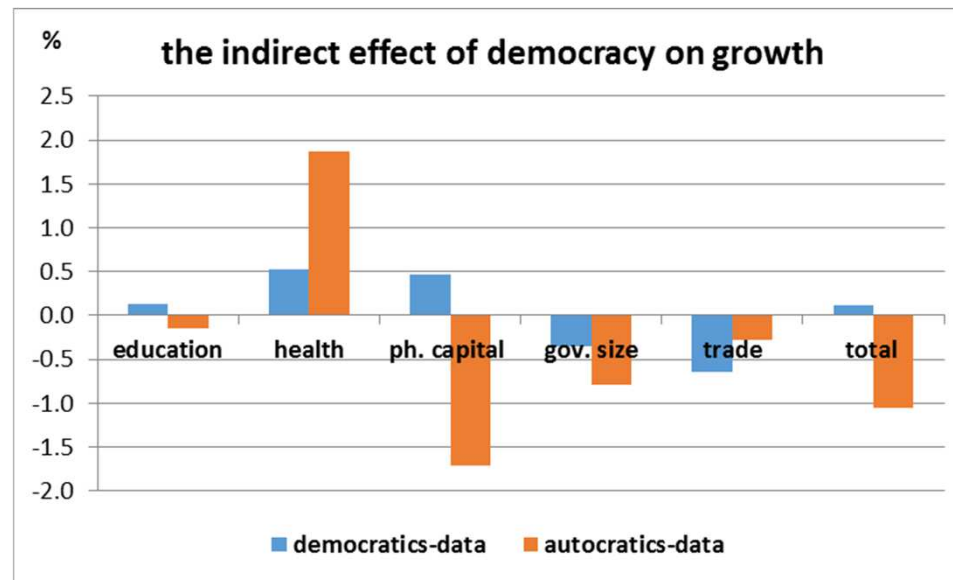
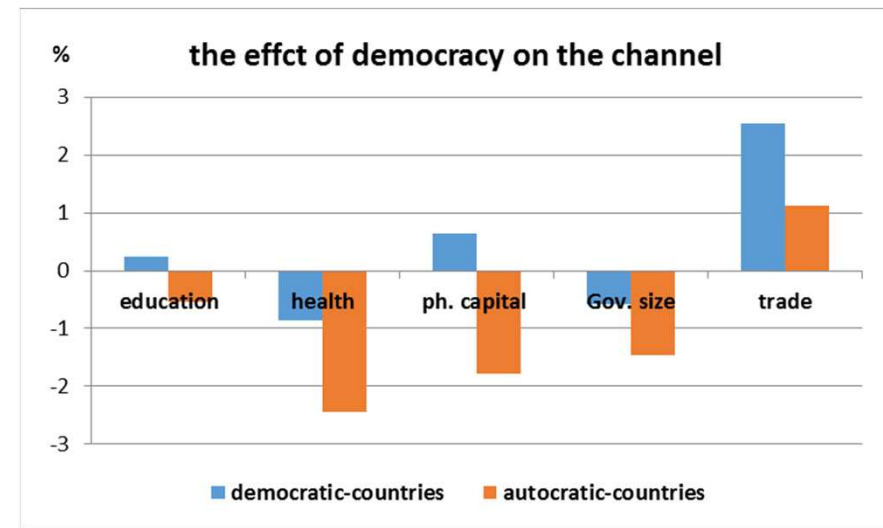
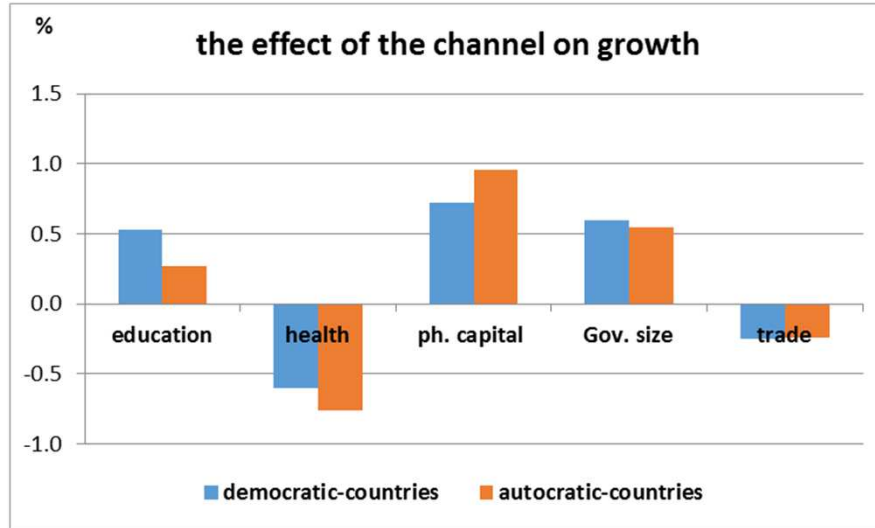
SUR: It is efficient because it takes into consideration correlation of errors across equations. However, it assumes that no endogenous variables on RHS of equations are included.

1. Estimating the effect of the channel variables on the growth.
2. Estimating the effect of democracy on the channels.
3. Computing the indirect effect of democracy on growth through particular channels.
4. Computing the total indirect effect of democracy on growth in MENA region.
5. Utilizing the delta method to calculate the standard errors of the indirect effect coefficients.

## Different democratic groups of countries , V-DEM Classification



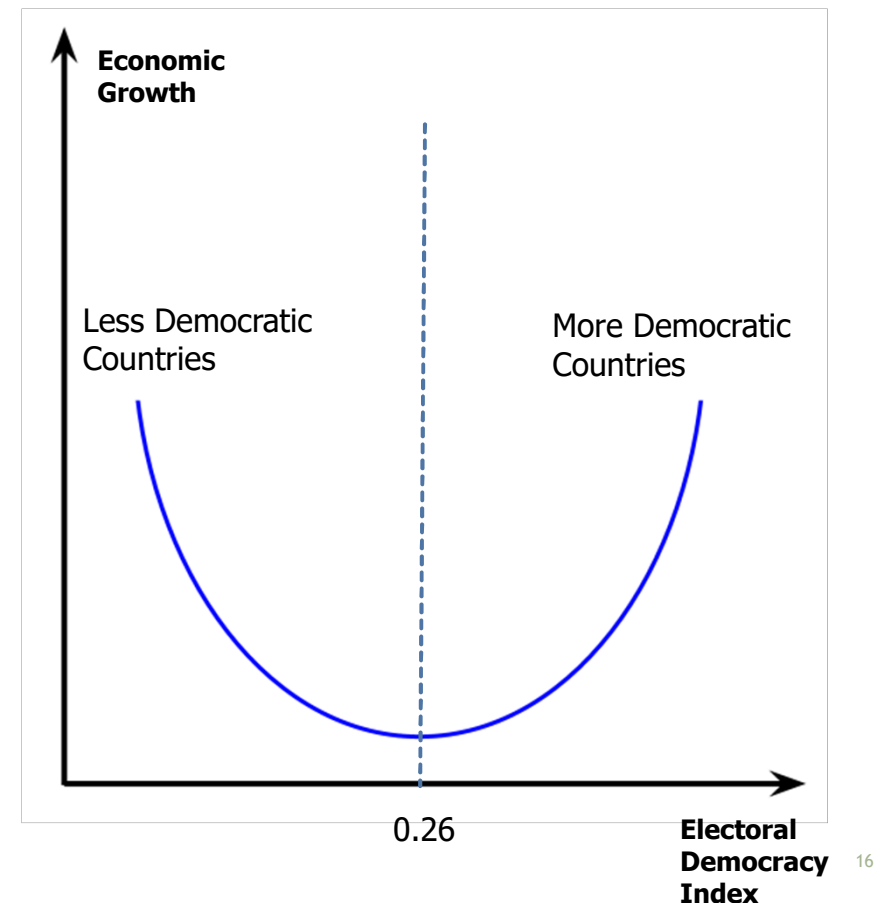




## “Different democratic groups of countries”

The overall indirect effect of democracy on growth is significant and non-monotonic.

Democracy hampers growth in the less Democratic countries, but fosters growth in the more democratic countries within the region.





# "Poor and Rich Countries"

DEM/EG (%)	total	capital	ph. capital	H. capital	education	health	gov. size	trade
<b>Electoral Democracy &amp; Electoral Autocracy</b>								
poor countries	-0.445**	0.494	0.075	0.419*	0.088	0.331**	-0.352**	-0.586***
rich countries	1.155***	2.155***	1.190***	0.965***	0.296***	0.669***	-0.433**	-0.567***
<b>Closed Autocracy</b>								
poor countries	-3.045***	-3.396***	-3.679***	0.282***	-0.581***	0.864**	0.608*	-0.256
rich countries	0.108*	0.538*	-0.368	0.906**	-0.073	0.979***	-0.171*	-0.259**
<b>Free and Partly Free</b>								
poor countries	-0.297	0.049	-0.187	0.235	0.172**	0.063	-0.190	-0.156*
rich countries	0.442***	1.146***	0.677***	0.468**	0.132***	0.337**	-0.431*	-0.272*
<b>Not Free</b>								
poor countries	-0.798***	-0.858***	-0.954***	0.096***	-0.178***	0.274*	0.586***	-0.526***
rich countries	1.568**	1.753***	1.202***	0.551***	-0.203***	0.754***	-0.176	-0.009
<b>Democratic-Countries</b>								
poor countries	-0.636**	0.325	0.217	0.108*	0.200***	-0.093	-0.269***	-0.692***
rich countries	0.282***	1.342***	0.526***	0.816***	0.118**	0.698***	-0.420***	-0.640***
<b>Autocratic-Countries</b>								
poor countries	-0.969***	-0.180***	-2.196***	2.016***	-0.127**	2.143***	-0.240	-0.549***
rich countries	0.567***	1.444***	0.127***	1.318***	-0.219**	1.537***	-0.947	0.069**

DEM/EG (%)	total	capital	ph. capital	H. capital	education	health	gov. size	trade
<b>Electoral Democracy &amp; Electoral Autocracy</b>								
before revolution	0.259***	1.193***	0.554***	0.639***	0.099	0.539***	-0.311***	-0.623***
after revolution	0.676***	1.665***	0.694***	0.971***	0.085	0.887***	-0.341**	-0.648***
<b>Closed Autocracy</b>								
before revolution	-0.228**	0.125***	-0.492	0.617***	-0.194**	0.811***	-0.097	-0.255**
after revolution	-0.335***	-0.021***	-1.384***	1.363***	-0.297**	1.660***	-0.081	-0.233**
<b>Free and Partly Free</b>								
before revolution	0.280**	0.917**	0.674***	0.243*	0.125**	0.118	-0.419**	-0.218**
after revolution	0.281**	0.982***	0.472***	0.510**	0.136***	0.374**	-0.408**	-0.293**
<b>Not Free</b>								
before revolution	-0.908***	-0.840**	-0.716**	-0.124*	-0.174***	0.050	0.456***	-0.523***
after revolution	-0.513***	-0.533***	-0.853***	0.319***	-0.178***	0.497***	0.493***	-0.473***
<b>Democratic-Countries</b>								
before revolution	-0.029***	0.953**	0.514***	0.440**	0.177***	0.263*	-0.377***	-0.606***
after revolution	0.291***	1.254***	0.392**	0.862***	0.180***	0.681***	-0.323***	-0.640***
<b>Autocratic-Countries</b>								
before revolution	-2.881***	-2.235***	-2.509***	0.274*	-0.136**	0.410	-0.978***	0.331*
after revolution	-0.891***	0.097***	-1.721***	1.818***	-0.143**	1.961***	-0.734***	-0.254*

- Democracy affects economic growth significantly and indirectly through human capital, physical capital, government size and openness.
- Democracy affects growth non-monotonically. It depends on the stage of democracy in each group of countries within the region.
- Improving democracy in the democratic-countries within the region motivates growth. However autocratic-countries should transfer their regimes towards democracy to gain the benefits of democracy on growth.

- Rich countries are more respondents to democracy than poor countries, therefore minimum level of per capita income is prerequisite for democracy in MENA region.
- After the revolution, democratic institutions are expanding access to human capital, but do so at the expense of physical capital accumulation. The overall indirect effect of democracy on growth is stronger after the revolution than before it.

- Other democracy indices, indicators, components
- The relationship between DEM and EG in different time periods, in different groups of countries
- The effect of DEM on EG via different channels; corruption, instability, inflation, income inequality
- Prerequisite for democracy in MENA region

Thank you

