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International Center for Public Policy
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The Determinants of Youth Unemployment in the Arab Countries

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Abstract

The Arab countries of the MENA region adopted a state-led development path in the sixties and seventies. Since then, the government and the public sector have become the principal owners of factors of production and labor force employer (Cammett et al., 2015). The private sector has played a relatively small role in the economy. Salehi-Isfahani (2012) projected high youth unemployment rate to be a key challenge. The purpose of this paper is two-fold. First, we discuss the development of youth unemployment over time in the Arab world. Second, we examine empirically the determinants of youth unemployment rate. The panel regression model includes the lagged unemployment rate to account for the persistent nature of unemployment in the Arab world. It also has macroeconomic variables (the GDP growth rate to account for Okun's law, the inflation rate, and a measure of state-led development), human capital (quality of education), and institutional (labor market flexibility and efficiency), and governance variables. Our approach is to use panel data on 115 developed and developing countries and accounts for the Arab countries through an Arab dummy and interaction terms. Random effects and system estimation methodologies are adopted. Empirical evidence shows that labor market efficiency, namely linking pay to productivity and reliance on professional management, and growth reduce youth unemployment rate in the non-GCC Arab countries. The evidence further shows that inflation rate, education quality, and state-led development decrease the unemployment rate in the GCC countries.

Keywords: youth unemployment; Arab countries; growth; labor markets; state-led development

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1. Introduction

The Arab countries of the MENA region adopted a state-led development path in the sixties and seventies.[1] Since then, the government and the public sector have become the main owners of the factors of production and the main labor force employer (Cammett et al., 2015). As a result of the choice to adopt a state-development path, a few employment challenges have manifested themselves, mainly in high youth unemployment, low skills and productivity of labor, and long waiting times between graduation and landing the first job in the government and public sector (Salehi-Isfahani, 2012).

The high youth unemployment challenge of the Arab countries associated with the state-led development path is the focus of this research. In this paper, we discuss the development of youth unemployment over time in the Arab countries. We then examine empirically the determinants of youth unemployment rate focusing on labor markets flexibility and efficiency.

The empirical model includes the lagged unemployment rate to account for the persistent nature of unemployment. The model also includes macroeconomic variables (the GDP growth rate to account for Okun's law, the inflation rate, and a measure of state-led development), human capital (quality of education), and institutional (labor market flexibility and efficiency) and governance variables.

Our approach is to estimate the empirical model using panel data on 13 Arab countries for the period 2007-2017. We adopt a system GMM estimation methodology building on Arellano-Bover (1995) and Blundell-Bond (1998).

[1] The MENA region Arab countries, as defined by membership of the Arab League, include Algeria, Djibouti, Egypt, Iraq, Jordan, Lebanon, Libya, Mauritania, Morocco, Somalia, Sudan, Syria, Tunisia, State of Palestine, and Yemen in addition to the six oil-rich Gulf Cooperation Council (GCC) countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE.

Empirical evidence shows that labor market efficiency, namely linking pay to productivity and reliance on professional management, and growth reduce the youth unemployment rate in the non-GCC Arab countries. Evidence also shows that inflation rate, education quality, and state-led development decrease in the GCC countries.

The paper is novel in two respects. First, it shows that Arab countries are heterogenous regarding the youth unemployment determinants. This is clear in the impact of state-led development. Second, unlike recent empirical work on Arab countries, this paper focuses on a larger sample of 13 Arab countries and for a longer period.

The paper is structured as follows. In section 2, we discuss the development of youth unemployment in the Arab countries. Section 3 provides a brief literature review of the youth unemployment literature. Sections 4 and 5 specify the empirical model and the estimation methodology. Sections 6 and 7 present and discuss the empirical results, while section 8 concludes.

2. Youth and Youth Unemployment in the Arab Countries

To assess the high youth unemployment manifestation of state-led development in the Arab countries, we start by profiling the share of youth in the population over time. Table 1 (see appendix) provides data on the share of youth (ages 15-24) in the population since the sixties when Arab countries embarked on a state-led development strategy. The table distinguishes the Arab countries into oil-rich, Gulf Cooperation Council (GCC), and non-GCC countries.

Table 1. Share of Youth in Population in the Arab Countries (ages 15-24; in percentage)

	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2020		1960-1999	2000-2020	Change
Algeria	17.2	19.7	20.3	21.5	22.6	16.8		19.7	19.7	0.0
Djibouti	20.2	18.3	20.4	20.0	21.0	19.5		19.7	20.3	0.5
Egypt	17.0	18.8	18.8	18.8	20.8	18.1		18.3	19.5	1.1
Iraq	16.9	18.3	19.5	21.3	20.3	20.1		19.0	20.2	1.2
Jordan	19.2	17.8	20.5	21.7	20.5	19.3		19.8	19.9	0.2
Lebanon	15.8	20.2	20.7	21.0	18.7	18.4		19.4	18.6	-0.9
Libya	17.2	16.8	19.4	22.3	21.9	17.6		18.9	19.7	0.8
Mauritania	18.4	18.9	19.9	20.1	20.5	19.5		19.3	20.0	0.7
Morocco	15.8	19.5	21.4	20.4	20.3	17.4		19.3	18.9	-0.4
Somalia	18.2	18.9	19.2	18.7	17.9	20.2		18.7	19.1	0.3
State of Palestine	19.3	18.2	20.0	19.6	20.2	21.3		19.3	20.8	1.5
Sudan	18.5	18.7	19.3	20.0	19.5	20.0		19.1	19.7	0.6
Syria	16.6	19.7	19.9	21.5	21.9	19.5		19.4	20.7	1.2
Tunisia	16.1	19.8	20.5	19.8	20.3	15.8		19.0	18.0	-1.0
Yemen	19.3	17.9	18.6	18.5	21.4	21.9		18.6	21.7	3.1
Average	17.7	18.8	19.9	20.3	20.5	19.0		19.2	19.8	
GCC Countries										
Bahrain	18.1	21.9	18.2	16.8	17.7	13.3		18.8	15.5	-3.3
Kuwait	19.9	18.0	17.9	16.6	16.7	11.8		18.1	14.3	-3.8
Oman	19.0	18.4	16.8	17.4	22.2	16.1		17.9	19.2	1.3
Qatar	20.8	21.1	17.0	14.1	16.0	14.4		18.2	15.2	-3.0
Saudi Arabia	18.4	18.3	18.4	17.6	18.6	15.7		18.2	17.2	-1.0
UAE	21.7	21.7	15.8	16.5	17.2	12.1		18.9	14.7	-4.3
Average	19.6	19.9	17.4	16.5	18.1	13.9		18.4	16.0	

Notes: Author calculations based on United Nations World Population Prospects 2019 data.

In the 15 non-GCC countries, the average share of youth in the population increased slightly from an average of 19.2 percent of the total population over the earlier four decades (1961-1999) to 19.8 percent in the last two decades. Youth share increased in 11 of the 15 countries (Djibouti, Egypt, Iraq, Jordan, Libya, Mauritania, Somalia, Palestine, Sudan, Syria, and Yemen).

In the six GCC countries, the average share of youth declined to 16 percent in the last two decades compared to 18.4 percent in the earlier four decades. One exception is Oman, however,

where youth share increased from 17.9 percent to 19.2 percent. With the share of youth increasing slightly in the non-GCC countries but decreasing in the GCC countries, have the Arab countries suffered a high youth unemployment rate, as Salehi-Isfahani (2012) projected? Table 2 presents the average youth unemployment rates in the Arab countries.

Table 2. Youth Unemployment Rates in Arab Countries (in percentage)

Country	1991-2000	2001-2010	2011-2019
Algeria	34.4	47.1	21.8
Djibouti	18.2	19.5	21.2
Egypt	26.0	27.5	24.5
Iraq	15.8	16.9	16.8
Jordan	37.3	31.3	28.9
Lebanon	18.9	21.2	17.8
Libya	44.4	46.5	48.8
Mauritania	13.7	14.2	14.9
Morocco	20.0	19.1	17.8
Somalia	21.3	21.9	21.2
Sudan	27.1	28.4	28.7
Syria	12.4	21.5	20.1
Tunisia	30.1	30.2	29.5
West Bank and Gaza	15.4	31.2	36.3
Yemen	16.4	19.1	22.1
Total	23.4	26.4	24.7
	GCC Countries		
Bahrain	3.5	3.8	5.0
Kuwait	5.7	5.3	10.2
Oman	10.2	10.2	12.0
Qatar	1.7	1.6	1.3
Saudi Arabia	25.1	24.9	29.2
UAE	5.0	6.4	7.4
Total	8.5	8.7	10.9

Notes: Author calculations are based on World Development Indicators (WDI) data.

Data suggests the average youth unemployment rate increased in the non-GCC countries from 23.4 percent in 1991-2000 to 26.4 percent in 2001-2010. However, the rate declined to 24.7

percent in the post-Arab Spring period (2011-2019). The Arab Spring started in Tunisia and Egypt in December 2010 and February 2011, respectively. The average youth unemployment rates were higher in Algeria, Jordan, Libya, and Tunisia compared to the other non-GCC countries.

In the GCC countries, in contrast, the average youth unemployment rate followed an upward trend over the past three decades. The rate increased slightly from 8.5 percent in 1991-2000 to 8.7 percent in 2001-2010 but increased by about two percentage points to nearly 11 percent following the Arab Spring. Among the six GCC countries, average youth unemployment rates were higher in Saudi Arabia.

Based on these statistics, high youth unemployment can certainly be considered a challenge in the non-GCC countries, as Salehi-Isfahani (2012) projected. In the GCC countries, however, youth unemployment seems to be relatively less of a challenge.

Accordingly, we should look into the factors causing youth unemployment in the Arab countries. What are the determinants of youth unemployment in the Arab countries? This is the empirical research question of this paper.

3. Determinants of Youth Unemployment – A Brief Literature Review

Providing a comprehensive review of the determinants of youth unemployment literature is beyond the scope of this paper. We only review recent studies of youth unemployment determinants.

In a recent study of 28 EU countries from 2008-to 2018, Bal-Domańska (2021) identifies the determinants of youth (un)employment in terms of economic, structural, and technological change, labor regulations, and knowledge factors. Economic factors include economic

development, GDP growth rate, job creation, and employment. According to Okun's law, the GDP growth rate reduces the unemployment rate; the youth unemployment rate is also sensitive to economic growth. Structural and technological factors relate to the structural and sectoral transformation of the economy. Structural and technological change can be beneficial to youth if youth are equipped with modern technological skills.

Labor regulations relate to the flexibility of labor markets. Reformed labor market regulations support job creation and youth employment.[2] The success of labor market reforms rests on the adopted labor market model whether it is flexible, rigid, or flexicurity (Sahnoun and Abdennadher, 2019). Similarly, Bernal-Verdugo et al. (2012) find that labor market flexibility, in particular hiring and firing policies and hiring costs, reduces unemployment, youth unemployment, and long-term unemployment.

Knowledge factors relate to education and vocational training. Knowledge-based economies are favorable to youth employment and education is key to increase youth employment rates (Bal-Domańska, 2021; Caroleo et al., 2017; International Labor Organization, 2017). Vocational training provides the necessary skills for youth (Korber 2019). Earlier Caroleo et al. (2017) stressed the importance of education and training and labor market regulations (in addition to demographics and cyclicality).

In another study of the 28 EU countries, Mursa et al. (2018) provide an interesting overview of the determinants of youth unemployment. They discuss the difficulties that youth face in the transition from the education system to the labor market. The education system may not equip youth with the needed labor market skills (Dietrich 2012) through training and apprenticeships in

[2] Labor market regulations include minimum wages, non-wage costs, employment protection legislation, and permanent contract rigidities (Votinius, 2014).

particular (Görlich and Katznelson 2018). Chitiba (2012) attributes this gap to the public education monopoly. Labor market policies, in particular employment protection, hinder the hiring of youth and the firing of existing unproductive or incompetent employees (Dietrich 2012).

Bayrak and Tatli (2018) adopt a macroeconomic and growth approach in explaining youth unemployment in OECD countries. Okun's law accounts for the negative relationship between GDP (growth) and youth unemployment, as Bal-Domańska (2021) points out. The Phillips curve explains the trade-off between the inflation rate and unemployment. They add that productivity, as a source of growth, increases youth unemployment in the short run but reduces it in the long run. They find a negative relationship between youth unemployment and growth rate, inflation rate, and gross savings.[3] However, there is a positive relationship between youth unemployment and labor productivity.

Focusing on labor markets as the main determinant of youth unemployment, a few studies found that labor market flexibility reduced unemployment (Agnello et al., 2014; Bernal-Verdugo et al., 2012, 2013). Other studies did not support this relationship (Liotti, 2020, 2022). Agnello et al. (2014) found that labor market flexibility reduced youth unemployment, especially in the long term.

Bernal-Verdugo et al. (2012) found that improved labor market regulations and institutions quality had a statistically significant negative impact both on the level and change of unemployment outcomes for total, youth, and long-term unemployment. Using a reduced form model to examine the static effects of labor market flexibility on youth unemployment, they regressed the youth unemployment rate on the labor market flexibility composite index, a time

[3] Savings finance investment, expand physical capital and increase employment.

measure of demand pressure, government size, degree of trade openness, degree of urbanization, population density, a financial crisis dummy, and the lagged unemployment rate. They found that a one standard deviation improvement in the composite labor market flexibility indicator reduced the youth unemployment rate by 1.41 percentage points. A similar regression containing the hiring and firing regulations index instead showed a reduction in the youth unemployment rate by 0.78 percentage points.

Estimating the dynamic nature of the relationship between labor market flexibility and the change in the youth unemployment rate, they found that an improvement in the composite labor market indicator of one standard deviation reduced the youth unemployment rate by a half percentage point. In addition, the hiring and firing regulations and the mandated costs of hiring had statistically significant negative effects.

On the other hand, the recent study by Liotti (2020) on youth unemployment in Italy found no evidence of a negative relationship between labor market flexibility and youth unemployment. Liotti (2022) found that economic growth and investment in active labor market policies reduced youth unemployment in 28 European countries.

Based on these studies, we plan to explain the youth unemployment rate in terms of macroeconomic variables, human capital, and institutional and governance variables. We turn to the empirical model in the next section.

4. Empirical Model

Building on the important historical role of state-led development in the Arab countries, the above empirical studies, and the persistent nature of unemployment, we express the empirical model as:

$$YUR = f(L.YUR, LABOR, GROWTH, EDUCATION, GFINANCE, INFLATION, CORRUPTION)$$

where Y*UR* is the youth unemployment rate, as modeled by the ILO.[4] Unlike the youth unemployment rate (calculated as the percentage of unemployed youth in the labor force) produced by national statistics authorities, the ILO-modeled youth unemployment rate data is available and do not suffer from missing observations, a problem in many Arab countries and other regions. The advantage of using ILO data is that it is standard across countries and less subject to variations in the definitions of youth and/or unemployment. Youth unemployment refers to the share of the labor force ages 15-24, who are without work but are available for and seeking employment. *YUR*, the dependent variable, is calculated as the share of the total youth unemployment as a percent of the total labor force ages 15-24.

L.YUR is the lagged dependent variable. It captures the persistence of the youth unemployment rate. This is similar to the rationale of Dietrich (2013) and Bal-Domańska (2021). *L.UR* is expected to have a positive coefficient, suggesting that a persisting unemployment rate and a negative state of the economy in the previous year increases the current youth unemployment rate.

LABOR is labor markets flexibility and efficiency, in particular the efficient use of talents. It is measured by the labor market efficiency pillar overall score from the World Economic Forum's Global Competitiveness Index (GCI), and some indicators of the two components of the pillar, as explained in section 3 above.

Of the flexibility component, we use labor-employer relations (C), wage determination flexibility (WF), and hiring and firing practices (HF). For the efficient use of talents, we use the link between

[4] Youth unemployment can also be measured using youth unemployment relative to adult and total unemployment (Caroleo et al. 2017). To account for the lack of integration of youth into the labor market, the share of young people in neither education nor employment (NEET), of which the unemployed comprise a sub-group has been used (Martin, 2009). However, the number of observations on the Arab countries is limited.

pay and productivity (PP) and the reliance on professional management (PM). All indicators are expressed in log forms.

The nature of labor-employer relations can be cooperative or confrontational. A perfectly cooperative relation gets the highest score of seven, while a confrontational relation gets the lowest score of one. Wages can be determined flexibly at the firm level with the highest score of seven. Alternatively, they can be determined through a unionized bargaining process with the lowest score of one.

Hiring and firing practices refer to the flexibility of these practices. Employers can flexibly determine them. If they do, this practice gets the highest score of seven. Alternatively, regulations can determine these practices. If they do, this practice gets the lowest score of one.

Linking pay to productivity refers to the extent labor pay is related to productivity. The link between pay and productivity can be strongly related with the highest score of seven. On the other extreme, they can be completely unrelated with the lowest score of one.

Reliance on professional management refers to how senior management is selected. If selection is based on merit and qualifications, the highest score of seven is assigned. If on the other hand selection is based on kinship and friendship, the lowest score of one is assigned.

The overall labor market efficiency pillar indicator is a summary measure of the flexibility and efficiency in retaining talents components. The best flexible and efficient performance receives the highest score of seven, while the lowest performance gets the lowest score of one. We expect the two labor market components to help youth (workers) find and accept available jobs. Flexible and efficient labor components also encourage employers to create more jobs as a result of the

minimum barriers to laying off workers if the need arises. Therefore, we expect a negative coefficient of *LABOR*.

GROWTH accounts for economic growth and is measured by the annual real GDP growth rate (in percent). The inclusion of the growth rate accounts for Okun's rates similar to Dietrich and Möller (2016), Dixon et al. (2017), and Marelli et al. (2013).

Dietrich and Möller (2016) examine the causes of youth unemployment in European countries and explain adult and youth unemployment rates primarily in terms of current and lagged growth rates. They find that the growth rates reduce both unemployment rates. When the growth rates fall below the trend rate, unemployment rates increase in the Mediterranean countries.

In revisiting the relationship between the unemployment rate and output gap - the Okun law, Dixon et al. (2017) use data on 20 OECD countries for the period 1985-2013 to explain the unemployment rates for young, prime-age, and older workers. They find that the output gap reduces the unemployment rates.

Marelli et al. (2013) examine youth and total unemployment rates in 27 high-income developed countries for the period 1980-2009. They find that the growth rate (lagged) reduces youth and the total unemployment rate.[5]

EDUCATION is the quality of education. It is measured by the Global Competitiveness Report's quality of education index (log). Education has been accounted for in Bal-Domańska (2021), Caroleo et al. (2017), Marelli et al. (2013), and Marelli and Vakulenko (2016), among other studies. We expect to have a negative coefficient since education provides the knowledge and

[5] Their empirical model includes labor market reform index, economic reform index, inflation, real interest rates, the population aged 0-14, education, part-time employment, unemployment benefits, employment tax, and expenditures on active labor market policies.

training necessary for employment. Quality education may result in over-qualification of youth or create mismatches between youth skills and the needed labor market skills. Therefore, education quality may increase the youth unemployment rate. Therefore, the expected coefficient of *EDUCATION* is ambiguous.

GFINANCE is government fiscal expenditures. It accounts for the major employment role government and public sector play in hiring employees in Arab countries. *GFINANCE* is measured by the general government's final consumption expenditures (as a percentage of GDP). This is similar to Bernal-Verdugo (2012). Although *GFINANCE* can reduce youth unemployment, a bloated government and public sector apparatus – as a component of government final consumption expenditures - may not be able to absorb youth employment. Accordingly, youth unemployment may increase. Therefore, the sign of the *GFINANCE* coefficient is ambiguous.

INFLATION accounts for the negative relationship between inflation and unemployment rates – the Phillips curve. It is measured by the annual percentage change of the consumer price index. This is similar to Bayrak and Tatli (2018). We expect a negative *INFLATION* coefficient.

CORRUPTION is the control of corruption in the economy. The absence of corruption encourages more investment and job creation, and thus increases the supply of jobs. It also helps in the professional management of labor relations and hiring. Therefore, we expect better control of corruption to be associated with a reduced youth unemployment rate. In examining youth unemployment in five MENA countries – Algeria, Egypt, Lebanon, Morocco, and Tunisia – using microdata, Fakih et al. (2020) find that perceptions about corruption increase the probability of youth unemployment rate. Similarly, Ndjié et al. (2019) examine the influence of

governance and macroeconomic variables on youth unemployment in Africa and find that the control of corruption reduces the youth unemployment rate.[6]

5. Estimation Methodology

Endogeneity is a potential issue, which arises from the unobserved country effects, the omission of variables, and reverses causality. Youth unemployment can dampen GDP and economic growth. In addition, with the increase in youth in the Arab countries and the likely negative influence on GDP and the growth rate, youth unemployment may influence the inflation rate. Therefore, we treat *GROWTH* and *INFLATION* as endogenous and adopt a system GMM estimation methodology along the lines of Arellano-Bover (1995) and Blundell-Bond (1998).

6. Empirical Results

Table 4 provides descriptive statistics for the Arab countries. The table shows that the mean youth unemployment rate is higher in the non-GCC countries. On macroeconomic performance, mean growth rates (*GROWTH*) and the government consumption expenditures (*GFINANCE*) are higher in the GCC countries, while the mean inflation rate (*INFLATION*) is lower. Mean human capital (*EDUCATION*), labor market performance indicators (*LABOR*), and control of corruption (*CORRUPTION*) are also higher in the GCC countries.

[6] They use a system GMM estimation method.

Table 4. Descriptive Statistics

	Obs.	Mean	Std. Dev.	Min	Max		Obs.	Mean	Std. Dev.	Min	Max		Obs.	Mean	Std. Dev.	Min	Max
	All Arab Countries						Non-GCC Countries						GCC Countries				
YUR	165	21.23	12.43	0.48	50.60		99	27.87	9.55	15.26	50.60		66	11.25	9.16	0.48	30.94
GROWTH	155	3.57	12.43	-62.08	123.14		89	3.01	15.91	-62.08	123.14		66	4.34	4.73	-7.08	19.59
INFLATION	150	4.95	5.40	-4.86	36.70		85	6.21	6.23	-3.75	36.70		65	3.31	3.45	-4.86	15.05
GFINANCE	145	16.29	4.27	6.73	30.00		79	15.88	3.36	9.94	21.56		66	16.78	5.14	6.73	30.00
EDUCATION	146	4.12	0.68	2.25	5.90		80	3.78	0.66	2.25	4.89		66	4.53	0.45	3.72	5.90
CORRUPTION	165	2.31	0.70	1.00	4.00		99	1.98	0.61	1.00	3.00		66	2.79	0.53	2.00	4.00
LABOR																	
LE	146	4.02	0.65	2.79	5.29		80	3.55	0.36	2.79	4.26		66	4.59	0.42	3.50	5.29
C	146	4.50	0.58	2.92	5.67		80	4.12	0.40	2.92	4.96		66	4.96	0.38	4.24	5.67
WF	146	5.27	0.66	3.42	6.23		80	4.89	0.62	3.42	5.85		66	5.72	0.35	4.51	6.23
HF	146	3.92	0.63	2.59	5.48		80	3.60	0.45	2.59	4.42		66	4.30	0.60	2.79	5.48
PP	146	4.03	0.70	2.09	5.53		80	3.61	0.52	2.09	4.57		66	4.54	0.52	3.35	5.53
PM	146	4.11	0.84	2.11	5.78		80	3.59	0.60	2.11	4.87		66	4.76	0.61	3.37	5.78

Table 5 provides the correlation matrix for the empirical model variables. It is insignificantly correlated with the growth rate. Government consumption expenditures and the inflation rate is positively correlated with the youth unemployment rate. Education quality, control of corruption, and labor market flexibility and efficiency indicators are negatively correlated with the youth unemployment rate.

Table 5. Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12
1	*YUR*	1.000											
2	*GROWTH*	-0.057	1.000										
3	*INFLATION*	**0.228**	-0.052	1.000									
4	*GFINANCE*	**0.213**	**-0.251**	**-0.316**	1.000								
5	*EDUCATION*	**-0.386**	0.064	**-0.433**	0.031	1.000							
6	*CORRUPTION*	**-0.506**	0.034	**-0.344**	**0.227**	**0.594**	1.000						
	LABOR												
7	LE	**-0.718**	0.060	**-0.317**	-0.121	**0.753**	**0.619**	1.000					
8	C	**-0.581**	0.054	**-0.205**	-0.141	**0.705**	**0.579**	**0.887**	1.000				
9	WF	**-0.691**	-0.007	-0.133	-0.151	**0.356**	**0.470**	**0.707**	**0.650**	1.000			
10	HF	**-0.537**	0.065	**-0.189**	-0.145	**0.591**	**0.521**	**0.768**	**0.760**	**0.636**	1.000		
11	PP	**-0.681**	0.058	**-0.276**	-0.097	**0.716**	**0.627**	**0.899**	**0.833**	**0.747**	**0.836**	1.000	
12	PM	**-0.579**	0.121	**-0.342**	-0.090	**0.785**	**0.615**	**0.876**	**0.831**	**0.539**	**0.673**	**0.859**	1

Notes: Bold fonts indicate the statistical significance of pairwise correlation at the 5 percent level.

Table 6 presents the one-step system GMM estimation results for the **non-GCC countries**. The **growth rate** exerts a negative influence on the youth unemployment rate, a one which is statistically significant at the 5 percent level in the fifth specification which reflects the labor market efficiency aspect of linking pay to productivity. An increase in the growth rate of one percentage point reduces the youth unemployment rate by nearly 1 percentage point. At a mean growth rate of 3 percentage points, the influence on the youth unemployment rate is about - 2.4 percentage points.

Table 6. System GMM Estimation Results for the Non-GCC Countries

	LE	C	WF	HF	PP	PM
L.*YUR*	**0.764*****	**0.801*****	**0.812*****	**0.802*****	**0.746*****	**0.816*****
	(0.113)	(0.118)	(0.115)	(0.099)	(0.104)	(0.090)
LABOR	**-9.749*****	-4.693	-0.567	1.426	**-9.032*****	**-4.223***
	(3.491)	(3.794)	(2.356)	(2.843)	(1.834)	(2.452)
GROWTH	**-0.754***	-0.696	-0.783	**-0.746***	**-0.815****	**-0.764***
	(0.398)	(0.471)	(0.486)	(0.403)	(0.397)	(0.407)
INFLATION	0.075	0.103	0.076	0.063	0.050	0.083
	(0.108)	(0.124)	(0.113)	(0.086)	(0.086)	(0.097)
EDUCATION	**7.899****	6.033	2.797	1.436	**7.414***	5.692
	(3.464)	(3.823)	(3.534)	(3.532)	(3.908)	(3.826)
GFINANCE	-0.054	-0.070	0.021	-0.004	-0.119	-0.131
	(0.168)	(0.158)	(0.213)	(0.220)	(0.182)	(0.189)
CORRUPTION	3.819	3.861	3.678	3.470	4.580	**3.770***
	(2.927)	(2.693)	(2.497)	(2.414)	(2.962)	(2.246)
Constant	8.277	3.902	1.456	1.399	9.387	4.270
	(6.628)	(5.362)	(9.280)	(8.343)	(8.598)	(6.951)
Observations	58	58	58	58	58	58
Number of countries	7	7	7	7	7	7

Notes: One-step system GMM estimation results. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The coefficients of overall **labor** market flexibility and efficiency and linking pay to productivity are negative and statistically significant at the one percent level. The coefficient of the former indicator suggests that a one percent improvement in overall labor market flexibility and efficiency reduces the unemployment rate by about 0.1 percentage point.

Education quality surprisingly increases the youth unemployment rate at a statistically significant level only in the first specification. An improvement in education quality by one percent increases the youth unemployment rate by about 0.08 percentage points.

In the **GCC** countries, **state-led development**, as indicated by government consumption expenditures, reduces the youth unemployment rate in four out of six specifications, as table 7 shows. In the second specification containing the labor-employer cooperation indicator, an increase in government expenditures by one percentage point reduces the unemployment rate by slightly above 0.1 percentage point.

Table 7. System GMM Estimation Results for the GCC Countries

	LE	C	WF	HF	PP	PM
L.*YUR*	**1.029*****	**1.019*****	**1.020*****	**1.025*****	**1.029*****	**1.019*****
	(0.026)	(0.025)	(0.021)	(0.031)	(0.023)	(0.027)
LABOR	1.327	-0.901	1.391	1.102	-0.297	-1.559
	(4.470)	(3.280)	(3.457)	(1.744)	(2.264)	(2.113)
GROWTH	-0.021	**-0.032***	-0.027	-0.026	-0.033	-0.010
	(0.025)	(0.018)	(0.020)	(0.023)	(0.023)	(0.015)
INFLATION	**-0.081***	**-0.090****	-0.073	**-0.087***	**-0.088****	**-0.074****
	(0.048)	(0.038)	(0.045)	(0.050)	(0.044)	(0.030)
EDUCATION	**-3.980*****	**-3.504****	**-3.910****	**-4.509****	**-3.281****	-2.898
	(1.507)	(1.604)	(1.622)	(1.874)	(1.653)	(1.765)
GFINANCE	-0.094	**-0.112****	**-0.095***	-0.087	**-0.115***	**-0.107***
	(0.075)	(0.057)	(0.054)	(0.063)	(0.066)	(0.057)
CORRUPTION	0.167	0.901	0.309	0.131	0.320	0.679
	(0.504)	(0.630)	(0.413)	(0.752)	(0.783)	(0.548)
Constant	5.526	8.013**	4.978	6.738**	7.206**	8.074***
	(6.606)	(4.007)	(5.794)	(2.793)	(3.228)	(2.649)
Observations	60	60	60	60	60	60
Number of countries	6	6	6	6	6	6

Notes: One-step system GMM estimation results. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Unlike the non-GCC countries, **education quality** reduces the youth unemployment rate in almost all specifications, suggesting that human capital development matters in youth finding jobs. In the first specification, an improvement in education quality by 1 percent reduces the unemployment rate by about 0.04 percentage points. A similar negative influence is observed for the **inflation rate**.

7. Discussion

The empirical results show that **growth** and **labor market flexibility and efficiency** matter more for the reduction in the youth unemployment rate in the non-GCC than in the GCC countries. In the GCC countries, on the other hand, the approach to combating the youth unemployment problem seems to center on the important government role in the economy, as reflected in the influence of **government expenditures, inflation rate, and education quality**. Expansionary fiscal and

monetary policies, which increase government and private expenditures as well as the improvement in the quality of education are the tools that reduce the youth unemployment rate.

8. Conclusion

This paper addresses the high youth unemployment challenge in the Arab countries. Statistics show that youth unemployment is more of a challenge in the non-GCC countries compared to the GCC countries. The paper then examined empirically the determinants of youth unemployment. Empirical evidence suggests the approaches to tackling the youth unemployment problems should be different in the two groups of countries. In non-GCC countries, the focus should be on growth and labor market flexibility. In the GCC countries, the focus should be on expanding the government role *per se*.

The high youth unemployment problem concern was raised in Salehi-Isfahani (2012) in association with the overarching government role in the MENA countries. This research shows that state-led development diminishes this concern in the GCC countries based on the 2007-2017 sample period.

What is the take for policymakers from this research? Growth matters for youth unemployment in non-GCC countries. Job-creating growth can help accommodate the growing number of young people. However, youth has to be *effectively* equipped with the necessary job market skills. These skills help reduce job search costs and frictional unemployment and provide youth with commensurate wages and salaries.

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