

## **Determinants of Youth Unemployment in OIC Member States: A Dynamic Panel Data Analysis**

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This paper examines the determinants of youth unemployment in OIC countries during the period 1993-2012. The study used a dynamic panel data method for a sample of 32 OIC countries, focusing on the impact of economic, demographic and institutional factors. The empirical results show that youth unemployment in OIC countries is influenced by economic environment measured by GDP growth, inflation and domestic investment. Fertility rate is found to be one of the significant factors behind the high rate of youth unemployment. Moreover, the results pointed out that bureaucracy quality has a negative impact on youth unemployment in OIC member countries. To improve the employability of young workers, the paper recommended that the economic environment in OIC countries should be ameliorated through effective fiscal, monetary and trade policies. In addition, public and private investment need to be expanded to provide job opportunities for young workers. Moreover, serious efforts should be made at vocational and technical education aiming at developing skills and experiences of young people.

### **1. Introduction**

Youth unemployment has been considered as one of the critical problems in developed and developing countries. Indeed, in all countries and regions young people (population ages between 15 and 24) have fewer opportunities to access the labor markets compared to the active adult population. Recent statistics show that young people in the World are estimated to be about 1.8 billion, constitutes one quarter of the world' population (Population Reference Bureau, 2013). However, about 75 million of them are unemployed and most of youth workers engage in hazardous jobs and informal sector, and their transition to decent work is slow and difficult (International Labor Organization (ILO), 2013).

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In the OIC countries<sup>2</sup>, the youth accounts for about more than 30% of the total population (World Bank, 2014). Although, young population could be a potential demographic asset for the OIC countries, youth employment is a critical challenge that faces all the OIC states<sup>3</sup>. In addition, since most of OIC countries located in the Middle East and North Africa (MENA), the recent statistics shows that this region holds the highest rate of youth unemployment in the World. For example, according to International Labor Organization's (ILO) statistics of 2011, the youth unemployment rate in the MENA region was about 24%, which is approximately twice the global average<sup>4</sup>. Moreover, the other OIC countries that situated in Asia and Sub Saharan Africa also suffer from high youth unemployment.

Youth unemployment may have multiple unfavourable economic, social and political effects. From the economic perspective, unemployment among youth means unutilised potential labor force, and then has a negative impact on production, economic growth and development. On the social front, failure of young persons to get a job and enjoy employment benefits may lead to frustration and social exclusion. From the political perspective, youth unemployment stimulates protests and demonstrations and, in turn, undermines the political stability. Therefore, tackling the problem of youth unemployment needs an in-depth analysis of its determinants. This would reveal the effect of some factors that may be subject to the control of policy maker in OIC countries.

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<sup>2</sup> OIC countries include, Afghanistan, Albania, Algeria, Azerbaijan, Bahrain, Bangladesh, Benin, Bosnia and Herzegovina, Brunei, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Côte d'Ivoire, Djibouti, Egypt, Gabon, Gambia, Guinea, Guinea-Bissau, Guyana, Indonesia, Iran, Iraq, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, Libya, Malaysia, Maldives, Mali, Mauritania, Morocco, Mozambique, Niger, Nigeria, Northern Cyprus, Oman, Pakistan, Palestinian territories, Qatar, Russia, Saudi Arabia, Senegal, Sierra Leone, Somalia, Sudan, Suriname, Syria, Tajikistan, Thailand, Togo, Tunisia, Turkey, Turkmenistan, Uganda, United Arab Emirates, Uzbekistan, and Yemen.

<sup>3</sup>The youth unemployment rate is the proportion of youth (persons aged 15-24) who are unemployed.

<sup>4</sup> In fact, the existent statistics on unemployment do not reflect the actual situation, since Arab countries lack systematic labor market surveys. Therefore, data on unemployment underestimates the problem of youth unemployment in the region.

This paper aims to identify the determinants of youth unemployment in the OIC countries, during last two decades. Specifically, the paper addresses the following questions: Why is youth unemployment so high in OIC countries? And What is the role of economic, demographic factors and institutional quality in explaining youth unemployment? Therefore, this paper would contribute to existing literature on youth unemployment in the OIC countries, as there is a dearth of studies on this issue.

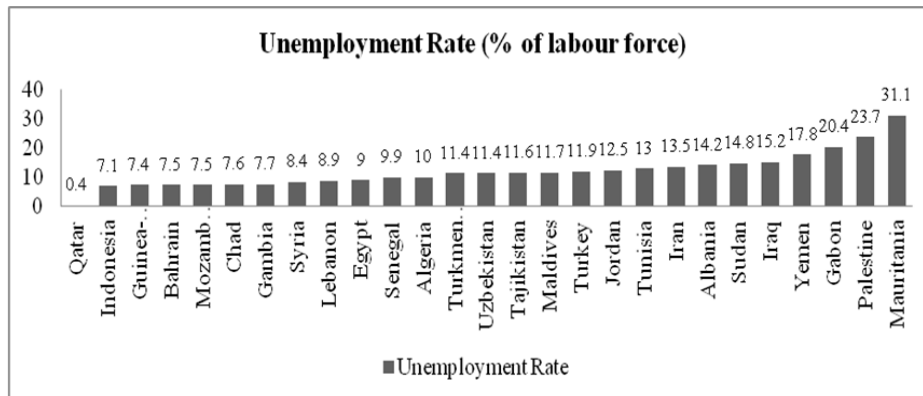
The contribution of this paper is to provide some policy recommendations that aim to improve the employability of young people in OIC countries. The paper would also contribute to the existing literature on youth unemployment in OIC countries, as to the best of our knowledge there are no empirical studies examine the causes of youth unemployment using OIC data. Moreover, the study investigates the effect of institutions like bureaucratic quality on youth employment in OIC countries.

The paper is organised as follows: the next section outlines some stylised facts about youth unemployment and labor markets in the OIC countries. Section three reviews the empirical literature on the determinants of youth unemployment. Section four outlines methodology and data used in the study. While section five presents the empirical results, section six conclude with some policy implications.

## **2. Youth Unemployment in the OIC countries: Some Stylized Facts**

Before identifying the determinants of youth unemployment in OIC member countries, it is useful to overview the situation of unemployment in OIC countries. Recent statistics show that OIC countries recorded significantly higher unemployment rates compared to the world, developed and other developing countries (SESRIC, 2012). Figure 1 below presents the unemployment rates in some OIC countries during 2012.

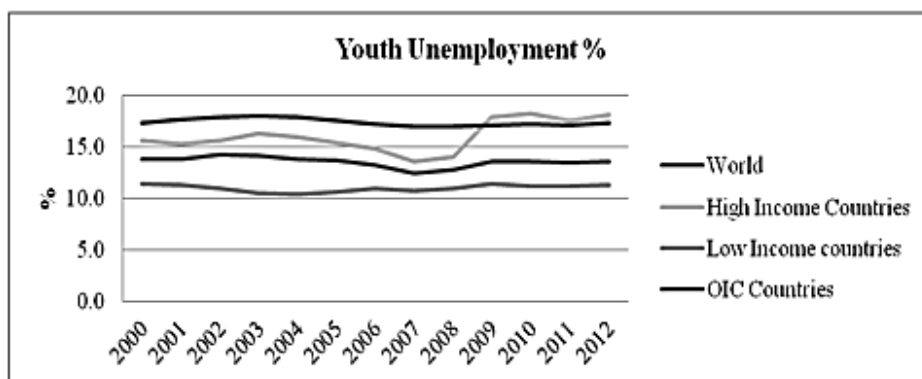
**Figure 1: Unemployment Rate in OIC Countries (2010)**  
(% of Labor Force)



Source: SESRIC BASEIND Database (2014).

The figure indicates that unemployment rate in OIC countries varies from one country to another. In Gabon, Palestine and Mauritania the rate of unemployment is estimated to be more than 20%. However, in the other countries except Qatar the rate of unemployment is ranging from 7 percent to 10 percent, which is equivalent to unemployment rate in most of developing countries.

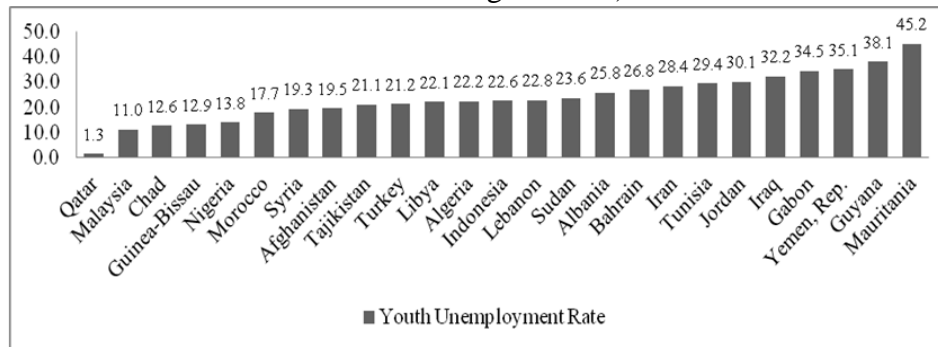
Regarding the youth unemployment, OIC countries host high rate of young unemployment, which is estimated around 17% in 2012 (World Bank, 2014). The problem of unemployment may be responsible for the unfavourable economic performance and low development outcomes as well as political instability in some OIC countries. As indicated in Figure 2, OIC countries have the highest rates of youth unemployment, among other regions, compared to low and high income countries. The Figure also show that youth unemployment in the OIC countries is persistent over the last two decades, estimated at about 17 percent, which is above the World rate. In other low income countries youth unemployment rates do not exceed 13%.

**Figure 2:** Youth Unemployment Rate by Region (2000 -2012)

Source: World Bank' Development Indicator (2014) and SESRIC BASEIND Database.

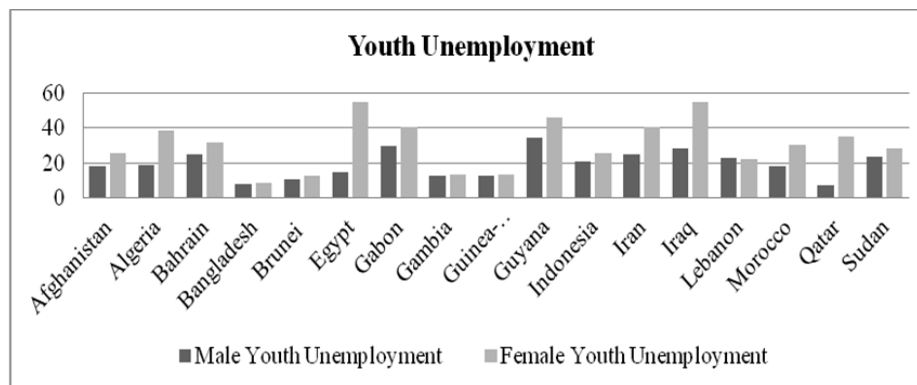
Regarding the distribution of youth unemployment in OIC countries, the statistics show that there is a variation in the level of youth unemployment from one country to another. As indicated in Figure 3, in 2010 the youth unemployment rates vary from 1.3% in Qatar to about 45.2% in Palestine. This situation of high unemployment rate is attributed to the low absorption power of labor markets, besides low experience of young workers and skills mismatch. Indeed, in most of OIC countries, particularly the countries of Middle East and Northern Africa (MENA) the ratio of youth is considered among the highest in the world. This situation has attributed to many factors including the high unemployment ratio in the youth cohort compared to the total population besides the weak absorptive capacity of these economies (Ebaidalla, 2014).

**Figure 3:** Youth Unemployment Rate in OIC Countries (2010) (% of labor force aged 15-24)



Source: World Bank' Development Indicator (2014)

In accordance with the distribution of youth unemployment by gender, Figure 4 below presents the youth unemployment rate according to gender in some OIC countries. As in other developing regions, females suffer over proportionally as reflected approximately by the 2:3 ratio of male to female youth unemployment. The figure also shows that more than 40% of the female labor force aged 15-24 is unemployed in Egypt, Guyana and Iraq. Also about more than third of the youth female labor forces are without jobs in Algeria, Bahrain, Gabon, Iran and Qatar. The high rate of female youth unemployment in the OIC countries may be attributed to low skills and experience of women. In addition most of OIC countries, particularly Arab states are dominated by some traditions and legislations which prevent women from work, besides early marriage and low education attainment (Ebaidalla, 2014).

**Figure 4:** Youth Unemployment in OIC Countries by Gender (2010)

Source: World Bank' Development Indicator (2014)

### 3. Determinants of Youth Unemployment: A Literature Review

Due to unfavourable consequences of unemployment, the issue of youth unemployment has received considerable attention from both researchers and policy makers. Many empirical studies on the determinants of youth unemployment have been emerged in the last decades. In the literature, several variables have been considered as main factors influencing youth unemployment including aggregate demand, education, demographic change, wages, labor market policies and individual characteristics. Here we briefly review the most important causes cited in the literature.

The level of aggregate demand is widely assumed as a significant variable that affecting youth unemployment. The reduction in aggregate demand due to economic crisis will increase youth unemployment rates. That is, in the time of recession, employers tend to reduce the number of workers particularly the young; hence, youth people are more likely to suffer from unemployment than adults. This also indicates that economic situation significantly affects youth unemployment, as economic downturn reduces demand for labor and in turn, increases youth unemployment (Ebaidalla, 2014). For example, during the recent global crisis 2008-2010 the number of unemployed youth has increased from 73.5 million in 2007 to 77.7 million in 2010 (ILO, 2011). In addition, during that same period, the rate of youth unemployment in

European countries rose to 4.5 point. Moreover, as long as the excessive supply of labor occurs in the recession periods, the employers prefer adult workers rather than non skilled-youth workers (Borowski, 1986).

Another factor affecting youth unemployment is the demographic transformations. It is well known that demographic transitions such as changes in the age structure of the population, fertility and child mortality affect the situation of youth labor markets (Gomez-Salvador and Leiner-Killinger, 2008). For example, an increase in the number of young people in the economy would have an adverse impact on the rate of youth unemployment. This is because young workers may complement adult workers, in terms of endowments and qualifications. Thus, an increase in the size of young workers relative to adult workers would then tend to raise unemployment, and in turn put a downward pressure on wages for young workers. Korenman and Neumark (2000) argued that, for a number of countries, an increase in the rate of young persons relative to prime age persons negatively influences employment and wages among the cohort size of young persons. On the other hand, the change in fertility and child mortality rates also results in a significant impact on youth unemployment. For example, the high rate of youth unemployment in some developing regions like South Asia and Sub Saharan Africa is attributed mainly to the high rate of fertility (births per woman). Assaad and Roudi-Fahimi (2007), who studied the youth unemployment in MENA countries, argue that the significant decline in child mortality leads first to an increase in the proportion of children under 15, and then to an increase in the proportion of young people aged 15 to 24.

In addition, many empirical studies have claimed that youth unemployment responds highly to the changes in minimum wage paid by employers. An increase in minimum wages reduces youth employment, as wage increases raise the cost of production and make firms hire high skilled workers rather than youth. This can be explained by the assumption of a competitive labor market which claims that demand for labor decreases as the cost of real wage increases. If a minimum wage level increases, the demand for lower skilled labor will go down through two routes. First, employers will tend to substitute lower skilled labor by higher skilled workers. Secondly, the scale of production may be reduced due to increased costs of production, which will result in the reduction of the demand for labor including lower-



skilled labor (Ghellab, 1998). However, most of empirical studies on the relationship between minimum wages and youth unemployment have found ambiguous results. For example, Blazquez et al. (2009) found no significant relationship between minimum wages and youth unemployment in Spain. However, Neumark and Wascher (1999) found the effect of minimum wages on youth employment to be significant. In addition, Pereira (2003) studied the relationship between minimum wages and youth employment in Portugal in 1987 and found that an increase in minimum wages, inter alia, had a negative impact on youth employment compared with that of older workers and made firms substitute youth workers by older ones.

In the same vein, the level of education is considered an important factor that influencing youth unemployment. Most of empirical literature argue that education significantly discourage youth unemployment. In fact, educated workers have better opportunities than illiterate people in seeking new jobs and gaining higher wages; hence, there is a lower risk of unemployment at higher educational levels (Kabaklarli, et al., 2011). However, another group of studies found that education may increases unemployment particularly of youth people (e.g. Galal, 2002). They attributed this phenomenon to a mismatch between the supply of education and demand for labor. In some cases the number of skilled jobs has not responded as quickly as the supply of educated workers, and thus high-skilled workers either had to accept jobs for which they were over-qualified or face unemployment (Venatus and Agnes, 2010). Therefore, investments in training institutions of vocational and technical education, which have a functional link with the labor market, are crucial and must be increased (Venatus and Agnes, 2010).

Furthermore, individual characteristics exert important impact on youth unemployment. It has been argued that the youth unemployment rate varies in response to individual features of the youth such as, gender, age, race and region. For example, young women and girls have historically been more likely to be unemployed, but due to the recent recessions this trend seems to have changed (Higgins, 1997). Ethnic minorities and the poor also may suffer from the risk of youth unemployment. Geographical location in terms of rural vs. urban residence has a significant negative impact on employment opportunities. In addition, gender discrimination in rural areas is likely

to exclude girls from the education as well as labor markets (Ebaidalla, 2014).

Finally, the labor market institutions and policies are widely acknowledged as the main determinants of youth unemployment. Labor market policies such as employment protection and regulation may lead to significant changes in youth unemployment. Many empirical studies found that employment protection regulations have a negative impact on employment in general and youth employment in particular (e.g., Venatus and Agnes, 2010). For example, a high level of protection against dismissal of workers tends to discourage firms from taking more workers during production booms, as it would be too costly to fire them when the economic situation is downturned. Hence, high levels of protection regulations make firms use only high-skilled workers as dismissals are costly (Ebaidalla, 2014). As a result, young workers have little opportunity to find jobs. In addition, if dismissing workers is unavoidable in time of recession, firms tend to dismiss young workers in higher numbers than old age workers as redundancy payments increase with job tenure (Gomez-Salvador and Leiner-Killinger, 2008).

#### 4. Methodology and Data

##### 4.1. Model Specification

To analyze the youth unemployment in OIC countries, the paper uses econometric approach, employing a panel data method. The specification of unemployment model employed in this study follows the previous empirical studies on youth unemployment such as, Choudhry et al. (2012), Anyanwu (2013) and (2014). However, the model is extended by demographic and institutional variables. Thus, the model is specified as follows:

$$YU_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 INF_{it} + \beta_3 TRD_{it} + \beta_4 INV_{it} + \beta_5 EDU_{it} + \beta_6 FER_{it} + \beta_7 BUR_{it} + \mu_{it} \quad (1)$$

Where the subscripts  $i$  and  $t$  represent the country and time period, respectively. The variable  $YU_{it}$  is the dependent variable capture the youth unemployment. This model relates youth unemployment to a set of explanatory variables that hypothesized to influence youth unemployment. The explanatory variables include economic,

demographic and institutional factors. GDP is the growth of gross domestic product, INF is the inflation rate, TRD is the trade openness variable, INV is domestic investment, ED is education, FER is the fertility rate, BUR is the bureaucracy quality. The bureaucracy quality variable is used to capture the impact of institutional quality, since efficient institutions are conducive to labor productivity and growth (Acemoglu et al., 2004). Finally,  $\mu$  is the error term with a zero mean and constant variance. The definition and sources of the variables are presented in Appendix I. All the variables are expressed in the natural logarithm except GDP growth because it bears negative values for some countries.

According to theoretical and empirical literature, the impact of GDP growth is expected to be negative, as an increase in country's income will reduce the employment level. This is also supported by the Okun's Law (1962) which is confirmed by many empirical studies<sup>5</sup>. The inflation rate would be negative as expected, since there is a negative association between the unemployment rate and inflation, as argued by Philips (1958). The impact of domestic investment is expected to be negative, as an increase in investment would encourage the employment of young people. The coefficients of trade openness and education are expected to be positive. The effect of fertility rate is also expected to be positive, because an increase of fertility level rises the numbers of young people, and hence their unemployment rates. Finally, the coefficient of bureaucracy quality is expected to be negative, since a country with bad institutions tends to suffer from unfavorable labor conditions and hence, a high rate of youth unemployment. This is also supported by several studies on economic growth which assumed that good institutions are necessary for labor and human capital progress (e.g. Acemoglu et al., 2004).

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<sup>5</sup> Economist Arthur Okun (1962) who first started studying the relationship between unemployment and economic growth, and his research on the subject since then has become known as Okun's law. Okun's law indicates a positive association between employment and output.

#### **4.2. Estimation Methodology**

To investigate the determinants of youth unemployment in OIC countries, the study uses a panel data method. Therefore, the error term  $\mu_{it}$  in equation 1 is a composite disturbance term that includes an unobserved country-specific effect  $\eta_i$ , a time-specific effect  $\lambda_t$ , and an error term  $\varepsilon_{it}$ . The composite error could be specified as follows:

$$\mu_{it} = \eta_i + \lambda_t + \varepsilon_{it} \quad (2)$$

The possible endogeneity of unemployment as well as the correlation of the unobserved country fixed effects with the error term implies that the orthogonality condition is not likely to be met for Fixed Effects (FE) or random effects (RE) estimator to produce consistent estimates. To consider endogeneity of regressors the appropriate method is to use an instrumental variables (IV) estimator. Therefore, this study uses the dynamic panel models based on the Generalized Method of Moments (GMM), developed by Arellano and Bond (1991)

The GMM dynamic method has many advantages over the conventional static panel data methods of fixed effects and random effects models. First, GMM model takes into account the time series dimension of the data and, hence it considers the short run effect. Second, it includes the non observable country specific. Finally, this method considers all the explanatory variables as endogenous, hence it account for the problem of endogeneity that may result from the correlation between the error term and the lagged dependent variable.

Empirically, there are two types of GMM models that have been widely used in estimating panel regressions: the first-difference GMM estimator, developed by Arellano and Bond (1991) and the system GMM estimator, developed by Arellano and Bover (1995) and Blundell and Bond (1998). However, the recent literature has shown that there are some possible statistical problems associated with the use of first-difference GMM estimator (Bond et al., 2001). That is, when the regressors are highly persistent, the instrumental variables used in difference GMM, such as, lagged levels of the dependent variable and of the explanatory variables might be weak instruments. In this situation, the first-differenced GMM model potentially suffers from a downward

bias, especially when the time periods ( $T$ ) is small (Blundell and Bond, 1998). On the other hand, the system GMM estimator overcomes the weak instruments problem by allowing the use of the lagged differences and lagged levels of the explanatory variables or other variables as instruments. Therefore, the analysis in this paper relies solely on the system GMM technique.

The System GMM estimators are drawn from the estimation of a system of two simultaneous equations, one in levels (with lagged first differences as instruments) and the other in first differences (with lagged levels as instruments). However, one possible problem that might be arising when adopting the system GMM is the invalidity of the lagged differences of the explanatory variables as instruments. Therefore, we examine the validity of the instruments by two tests: Sargan test of over-identifying restrictions and Arellano and Bond (AB) test of serial correlation. Furthermore, the study tests the endogeneity problem applying Durbin (1954), Wu (1974) and Hausman (1978) endogeneity test.

### ***4.3. Data Sources***

The paper uses annual data for a sample of 32 OIC countries over the period 1993-2012. The data on employment, macroeconomic and demographic variables are obtained from several sources including World Bank's development indicators and IMF Financial Statistics (IFS). Data on institutional quality (bureaucracy quality) is sourced from the International Country Risk Guide (ICRG) statistics<sup>6</sup>.

The summary statistics of the variables that used in our analysis is presented in Appendix II. It is clear that the inflation rate, trade openness and education vary greatly across countries. The descriptive statistics also shows that the youth unemployment in OIC countries is relatively high and varies across member states. Interestingly, the

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<sup>6</sup> The International Country Risk Guide (ICRG)' political stability indicators comprises 12 institutional measures - government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability, and bureaucracy quality.

standard deviation of economic growth is small, implies that the income of OIC countries grow slowly and unequally distributed.

## 5. Empirical Results and Discussion

The estimation results of equation (1) using system GMM method are presented in Table 1 below. Column 3 presents the results of GMM model while column 2 contains the results of fixed effect estimates which presented for the purpose of comparison.

**Table 1:** The Results of System GMM estimation (1995-2010)

Variable	Fixed Effects	GMM
Constant	3.984 (17.81)	0.049 (0.50)
Youth unemployment (-1)	0.001 (2.14)	0.998*** (15.20)
GDP Growth	-0.007 (-3.25)	-0.015* (-1.88)
Inflation	0.043 (3.36)	-0.212** (-2.21)
Trade openness	-0.031 (-2.93)	0.018** (2.46)
Domestic Investment	0.037 (3.13)	-0.028*** (-4.00)
Education	-0.066 (-2.87)	-0.011 (-1.20)
Fertility	-0.007 (-0.485)	0.817* (1.82)
Bureaucracy	3.984 (17.81)	-0.344 (-0.55)
Observations	640	640
Sargan Over-identification Test		2.192 (0.426)
Durbin–Wu–Hausman Test		0.062 (0.023)
AB- test for AR(1)		5.252 (0.000)
AB- test for AR(2)		0.839 (0.547)

Notes: Figures in Parentheses are t-statistics  
\*\*\*, \*\* and \* denotes significance at the 1, 5 and 10 percent level

The estimation is two steps System GMM, instruments used in the analysis are the first lagged difference and the second lagged level of dependent and explanatory variables.

Durbin–Wu–Hausman and Sargan tests are asymptotically chi-sq distributed, with p values reported in brackets.

The results of Table 1 show that the Sargan and Arellano and Bond tests suggest that GMM regression do not suffers from any problems with the instruments, and there are no second order serial correlation problems in the estimated model. The Durbin–Wu–Hausman test statistic also rejects the null hypothesis that all regressors in the model are exogenous at any reasonable degree of confidence. Thus, we conclude that all variables in the model are endogenous and this constitutes a suitable justification for using GMM method.

Focusing on the results of system GMM model in column 3, we find that most of the estimated coefficients bear the expected signs and in line with the theory. The results also indicate that all the variables are statistically significant except education and bureaucratic quality. The results show that GDP growth has negative and significant impact on youth unemployment, implying that increasing economic growth reduce the youth employment in OIC countries. This result confirms the validity of Okun's Law for OIC countries. The coefficient of inflation is also negative and significant, indicating that Philips Curve' hypothesis holds in the OIC countries. Unexpectedly, the trade openness is found to have positive impact on youth unemployment, implying that a country with high degree of trade openness tends to experience more youth unemployment. This result could be explained by the fact that trade openness in OIC countries are mainly due the high imports which hurts the local industries and increase unemployment in general and youth unemployment in particular. Moreover, the results show that the coefficient of domestic investment is negative and significant, suggesting that increasing investment tends to discourage youth unemployment in OIC countries. Therefore, we conclude that economic environment plays a significant role in explaining youth employment in OIC countries. This also implies that the demand side of labor market has an important role in influencing youth unemployment in OIC countries.

The results of Table 1 also reveal that the coefficient of education is negative but it is not significant. This finding implies that labor supply factors like education has no significant impact on youth unemployment

in OIC countries, since demand side factors are the most important variables influencing youth unemployment rate. In addition, the results of system GMM model indicate that the impact of fertility is positive and significant, suggesting that high fertility rate increases the opportunity of youth people to confront unemployment. This result also indicates that a country with high level of fertility tends to suffer from high rate of youth unemployment. Furthermore, the results reveal that bureaucracy quality has a negative effect on youth unemployment, but it is not significant<sup>7</sup>.

## **6. Conclusion and Policy Implications**

Motivated by high rates of youth unemployment in OIC countries, this study aims at identifying the determinants of youth unemployment in the region. The study used a dynamic panel data method for a sample of 32 countries during the period (1993-2012). The analysis focused on the impact of economic, demographic and institutional quality.

The empirical results show that real GDP growth, inflation and domestic investment exert negative and significant impact on youth employment. The results also show that trade openness has positive and significant effect of youth unemployment in OIC countries. These findings imply that economic environment play a significant role in explaining youth unemployment in OIC countries. In addition, the results also show that demographic changes measured by the fertility rate have positive and significant effects on youth unemployment in OIC countries. Furthermore, the results pointed out that institutional quality measured by the quality of bureaucracy has a negative impact on youth unemployment. This finding indicates that a country with an inefficient bureaucratic system is more likely to suffer from youth unemployment.

Based on the above findings, many policy recommendations can be provided aiming at improving the employability of young people in OIC countries. First and foremost, the economic environment needs to be given considerable attention using sound economic policies. Thus, effective fiscal and monetary policies should be adopted to foster the GDP growth and attain economic stability via reducing the inflation

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<sup>7</sup> Bureaucracy quality index is scaled from zero to six. Higher scores indicate more bureaucracy quality.



rates. The trade sectors need to be paid serious efforts to improve the exports capacity and competitiveness so as to create more jobs for young people. In addition, public and private investment should be enhanced in projects that provide opportunities for youth. Moreover, attractive incentives should be offered to foreign investment aiming at increasing the production capacity and job opportunities.

On the demographic front, health and family planning programs should be at the top of policy agenda. This is because OIC countries suffer from high level of fertility and population growth. Besides, OIC countries need to pay great attention to educational policies. Therefore, serious efforts should be paid to vocational and technical education aiming at developing skills and experiences of young people so as to help them to enter the labor markets.

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## Appendices

### Appendix I: Description and Sources of Variables used in the Regression Analysis

Variable	Definition	Source
Youth Unemployment	Measured as residual of Employment to Population Ratio, Ages 15-24 Total (%)*.	World Bank's World Development Indicators
Real GDP Growth	Growth of gross domestic product	World Bank's World Development Indicators
Inflation Rate	Annual inflation rate measured by the change in consumer price index.	IMF Financial Statistics and World Bank's World Development Indicators
Trade Openness	Measured by the ratio of (Exports +Imports) to GDP	IMF Financial Statistics and World Bank's World Development Indicators
Domestic Investment	Domestic Investment, measured by fixed capital formation as share of GDP %	World Bank's World Development Indicators
Fertility Rate	Measured by births per woman	United Nations, World Population Prospects and World Bank's World Development Indicators.
Education	Measured by ratio of total secondary enrolment to the population	World Bank's World Development Indicators
Bureaucracy Quality	Bureaucracy quality, measures autonomy from political pressure and strength and expertise to govern without drastic changes in policy or interruption in government services. (scale from zero to six)	International Country Risk Guide (ICRG), (2013)

Note: All the variables are expressed in the natural logarithm, except GDP growth.

\* Due to the lack of systematic labor surveys in OIC countries the data on unemployment of total youth as % of total labor force ages 15-24 is not available.

**Appendix II: Summary Statistics of Sample Data**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Youth Unemployment	51.80	15.05	24.3	68.2
GDP Growth	4.65	4.21	-15.03	33.99
Inflation	8.41	14.89	-4.87	132.82
Trade Openness	71.99	34.73	11.44	189.40
Domestic Investment	21.35	6.88	4.58	47.85
Education	56.90	29.69	5.16	115
Fertility	4.10	1.71	1.49	7.77
Bureaucracy	1.70	0.73	0	3.5

**Appendix III: List of OIC Countries that Considered for the Study**

<b>No</b>	<b>Country Name</b>	<b>No</b>	<b>Country Name</b>
1	Albania	17	Malaysia
2	Algeria	18	Mali
3	Bahrain	19	Morocco
4	Bangladesh	20	Mozambique
5	Brunei	21	Niger
6	Burkina Faso	22	Nigeria
7	Cameroon	23	Pakistan
8	Egypt	24	Qatar
9	Gabon	25	Saudi Arabia
10	Gambia	26	Senegal
11	Guinea	27	Sudan
12	Indonesia	28	Syria
13	Iran	29	Togo
14	Jordan	30	Tunisia
15	Kuwait	31	Turkey
16	Lebanon	32	Uganda