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# Economic Growth and Female Labor Participation in Islamic Countries: Evidence from Labor Kuznets Curve

**Saime Kavakcı** [1]

## Abstract

As a result of industrialization and various economic developments, female participation in the labor force has been ensured and this participation has increased day by day. Public, and private sector representatives make various investments, especially for including females in the labor force. There are many studies in the literature on the relationship between female participation in the labor force and economic development processes. The main question of this study is whether it is possible to differentiate the U-shape, which is realized as pre-industrial and post-industrial in modern countries, in Islamic countries. Contrary to the existing literature, the study argues that there is an inverted U-shaped (Kuznets curve) relationship between female labor and economic growth in Islamic countries, not a U-shaped relationship. Accordingly, it is argued that women in Islamic countries join the labor force when the economy is deteriorating and leave the labor force when the economy is improving. Within the framework of this hypothesis, the study investigates the Kuznets curve relationship between female labor force participation and economic development using data from 39 Islamic countries between 1990 and 2019. The study employs panel data analysis, a quantitative research method, to explore this relationship. As a result of the study, the Kuznets curve was found in at least one model in Iran, Kazakhstan, Lebanon, Morocco, Pakistan, Kyrgyz Republic, Maldives, Mali, Mauritania, Sudan, Tunisia, Senegal and Comoros. The U-shaped feminization hypothesis is confirmed in at least one model in Algeria, Azerbaijan, Bangladesh, Indonesia, Iraq, Jordan, Malaysia, Oman, Türkiye, Yemen, UAE, Burkina Faso, Uzbekistan, Tajikistan, and Turkmenistan. In line with the study's claim, some Islamic countries represent the Kuznets curve contrary to the general feminization U theory. Religion, culture, and legal codes are thought to be the reason behind the Kuznets curve found between female labor force participation rate and economic development.

**Keywords**: Female Labor Participation, Economic Growth, Kuznets Curve, U-Shape, Islamic Countries

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# İslam Ülkelerinde Ekonomik Büyüme ve Kadınların İşgücüne Katılımı: Kuznets Eğrisinden Kanıtlar

**Saime Kavakcı** [1]

## Öz

Sanayileşme ve çeşitli ekonomik gelişmeler sonucunda kadınların işgücüne katılımları sağlanmış ve bu katılım gün geçtikçe artmıştır. Özellikle kadınların işgücüne dahil olmasına ilişkin kamu ve özel sektör temsilcileri çeşitli yatırımlar yapmaktadır. Kadınların işgücüne dahil olmaları ve ekonomik kalkınma süreçleri arasındaki ilişkiye dair literatürde birçok çalışma bulunmaktadır. Bu çalışmanın temel sorusu, modern ülkelerde sanayi öncesi ve sanayi sonrası olarak gerçekleşen U şeklinin İslam ülkelerinde farklılaşmasının mümkün olup olmadığıdır. Çalışmada mevcut literatürün aksine İslam ülkelerinde kadın istihdamı ile ekonomik büyüme arasında U şeklinde değil, ters U şeklinde (Kuznets eğrisi) bir ilişki olduğu savunulmaktadır. Bu doğrultuda, İslam ülkelerinde kadınların ekonomi kötüye gittiğinde işgücüne katıldıkları, ekonomi iyiye gittiğinde ise işgücünden çıktıkları savunulmaktadır. Bu iddia çerçevesinde çalışma, 1990-2019 yılları arasında 39 İslam ülkesinin verilerini kullanarak kadınların işgücüne katılımı ve ekonomik kalkınma arasındaki Kuznets eğrisi ilişkisini araştırmaktadır. Çalışmada bu ilişkiyi araştırmak için nicel bir araştırma yöntemi olan panel veri analizi kullanılmıştır. Çalışmanın sonucunda, Kuznets eğrisi İran, Kazakistan, Lübnan, Fas, Pakistan, Kırgız Cumhuriyeti, Maldivler, Mali, Moritanya, Sudan, Tunus, Senegal ve Komorlar'da en az bir modelde tespit edilmiştir. U şeklindeki feminizasyon hipotezi ise Cezayir, Azerbaycan, Bangladeş, Endonezya, Irak, Ürdün, Malezya, Umman, Türkiye, Yemen, BAE, Burkina Faso, Özbekistan, Tacikistan ve Türkmenistan'da en az bir modeli doğrulamaktadır. Çalışmanın iddiası doğrultusunda bazı İslam ülkeleri, genel feminizasyon U teorisinin aksine Kuznets eğrisini temsil etmektedir. Kadın işgücüne katılım oranı ve ekonomik kalkınma arasında tespit edilen Kuznets eğrisinin arkasındaki nedenin din, kültür ve yasal kodlar olduğu düşünülmektedir.

**Anahtar Kelimeler:** Kadın İstihdamı, Ekonomik Büyüme, Kuznets Eğrisi, U Şekli, İslam Ülkeleri

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## Introduction

There have been many economic, social, and cultural developments with industrialization. One of these developments is the quality of labor needed in the labor market. Female participation in the labor force will decrease and then increase with the transition from the pre-industrial agricultural economy to the industrial economy. Early researchers examining the relationship between female labor force participation and economic development have found a U-shaped relationship (Boserup, 1970; Goldin, 1995). After the first studies, the relationship between female labor and economic development has been analyzed with various data period and country groups (Altuzarra et al., 2019; Belke & Bolat, 2016; Chapman, 2015; Çağatay & Özler, 1995; Doğan & Akyüz, 2017; Lechman & Kaur, 2015; Lechman & Okonowicz, 2013; Olivetti, 2013; Tam, 2011; Tansel, 1998; Tsani et al., 2013).

The factors affecting female participation in the labor force were examined through various variables. Studies have shown that the educational level of female, the cultural structure of the society they live in, and the democratic environment in the country have various effects on female participation in the workforce (Bayanpourtehrani & Sylwester, 2013a; Bussemakers et al., 2017; Doumato & Posusney, 2003; Fernández, 2013; King & Hill, 1993; Tyrowicz et al., 2018).

Female labor force participation and economic development have been researched on various country groups. Among the country groups, various classifications have been made including Islamic countries (Gulf countries, Mena region, etc.) (Doumato & Posusney, 2003; Haghighat-Sordellini, 2009; King & Hill, 1993; Spierings, 2015; Yurtseven, 2015). Studies in this field are generally at panel data level. Various studies have also been conducted to measure the impact of religion on female labor force participation. In these studies, it has been found that the influence of Arab culture or the industrial sector, which has developed due to oil revenues, is more than the direct influence of Islam (Korotayev et al., 2015; Ross, 2008). Even if there several studies related to determine of female labor force participation in Islamic countries. Studies examining the U shape are limited.

The main question of this study is the possibility of differentiation of the U-shape, which is realized as pre-industrial and post-industrial in modern countries, in Islamic countries. This study argues that there is no U-shaped but an inverted U-shaped (Kuznets curve) relationship between female labor and economic development in Islamic countries. The claim is that female in Islamic countries enter the labor force when the economy is bad and exit the labor force when the economy improves. Research on the U-shape in Islamic countries remains limited. This study aims to make a significant contribution to the literature on economic development and female labor force participation in Islamic countries.

The article consists of 5 parts, including the introduction. Following the literature review on the subject and the information on the data in the article, the study ends with the Conclusions and Discussion section, where the results are evaluated, and various policy recommendations are made.

## Literature Review

The basis of Kuznets curve theory is the relationship between the deterioration of environmental conditions and the level of per capita income. According to Kuznets curve theory, as per capita income increases, environmental pollution first increases and then decreases. Kuznets curve theory has been studied in terms of various variables such as environmental, tourism, female labor participation, etc.

The female labor force participation (FLFP) and economic development was first investigated by Boserup (1970, pp. 1-283). Focusing on the emergence of gender models in labor force participation, Boserup examines the changes in population pressure, modernization of agriculture, colonization, and changing employment opportunity structures in her study. Result show that the privileged access of men to education and technology in the first stage of development removes female from employment, but that female employment increases in the later stage of development.

Based on 1980-85 data for the United States, the first empirical evidence for the validity of U hypothesis was provided by Goldin (1995, pp. 63-84) indicate that the relationship between the labor force participation rate of female aged 45-59 and GDP per capita is U-shaped. It has been determined that the income effect is dominant in the decreasing part of the U shape and the substitution effect is dominant in the increasing part. Goldin (1995, pp. 63-84) bases the U hypothesis on the fact that female are largely absent from the workforce in periods when agricultural production is dominant, and income is very low. Therefore, female often work as unpaid family workers in the field or the household. As a result of the expansion of markets and the use of new technologies, incomes increase and female labor force participation decreases. With the increase in family income, female withdrawal from paid jobs is explained by the income effect. However, as the education level of female and the value of female labor increase, female will return to working life. In this period, there is a substitution effect. In summary, the income effect is dominant in the decreasing part of the U shape and the substitution effect is dominant in the increasing part.

There have been many studies examining the relationship between female labor force participation and economic development. In many of these studies, results supporting the U hypothesis were obtained (Altuzarra et al., 2019; Belke & Bolat, 2016; Chapman, 2015; Çağatay & Özler, 1995; Doğan & Akyüz, 2017; Lechman & Kaur, 2015; Lechman & Okonowicz, 2013; Olivetti, 2013; Tam, 2011; Tansel, 1998; Tsani et al., 2013).

Çağatay and Özler (1995, p. 1883) analyzed the relationship between female labor force participation and macroeconomic changes associated with long-term economic development processes and structural adjustment, using cross-country data from 1985 to 1990. Result support that the relationship between long-term development and the female labor force is U-shaped. On the other hand, Tansel (1998, p.3) investigated the validity of the U hypothesis for Turkey using the cross-section data for 67 provinces for 1980,1985 and 1990. The result show that U shape is valid, and education is one of the important factors increasing female labor force participation.

Luci (2009, p. 103), Tam (2011, p. 140) and Lechman and Kaur (2015, p. 246) investigate the validity of the U shape for 165, 130 and 162 countries, respectively. Empirical finding supports the validity of the U shape in all studies. Tsani et al. (2013, p. 323) also obtained

results confirming the U hypothesis for Southern Mediterranean countries. According to the findings obtained by Olivetti (2013, p. 2) from the data of the United States for the years 1890-2005, it has been revealed that the U hypothesis is valid not only in developing countries but also in historically developed countries. In their study, Lechman and Okonowicz (2013, p. 1) showed the existence of a U-shaped relationship by dividing 162 world countries into four income groups between 1990 and 2012. According to the findings, this relationship was mostly confirmed in low-income countries. The study of Chapman (2015, p. 5) also supported U hypothesis using data of 20 countries in the Middle East and North Africa (MENA) for the period 1990-2012. Belke and Bolat (2016, p. 70) investigate the determinant of the female labor participation force for 148 developing and developed countries using the data from 1991 to 2014. The result from GMM model shows that the U-shape hypothesis is valid in developing countries.

Doğan and Akyüz (2017, p. 33), on the other hand, tested the U hypothesis on the data of the 2000Q1-2013Q4 quarters of Turkey. According to the findings, it has been determined that there is a U-shaped relationship between economic development and female labor participation. Altuzarra et al. (2019, p. 1) analyzed the U hypothesis over the data of the 28 countries of the European Union for the period 1990-2016. While the authors found a U-shaped relationship in the analysis for all European countries (EU-28), in the analysis in which the European Union countries were divided into old (EU-15) and new (EU-13) members, the U hypothesis valid only for the new EU countries.

In addition to all these studies, there are also studies in which the U hypothesis is rejected (Lahoti & Swaminathan, 2013, p. 1; Verme, 2015, p. 1) or that precipitate the relationship between economic development and female labor force participation is weak (Gaddis & Klasen, 2014, p. 639). Lahoti and Swaminathan (2013, p. 1) were unable to detect a systematic U-shaped relationship as a result of their analysis using state-level data from India' for the years 1983-1984 and 2011-2012. Gaddis and Klasen (2014, pp. 639-640)'s study for different country groups and time period show that weak empirical evidence for the validity of the U-shaped relationship was obtained when GMM method was used, but this relationship disappeared when they used dynamic panel data econometrics. Verme (2015, p. 1) investigate the validity of the U hypothesis for the MENA region using data from 1990 to 2012. Result show that U hypothesis is not valid.

Fatima and Sultana (2009, p. 182)'s study examining the existence of a U-shaped relationship between female labor force participation and economic development in Pakistan. According to the findings, U shape is valid in Pakistan.

In studies dealing with the relationship between female labor force participation and economic development were used different control variables such as wages, fertility, education, inflation etc. Çağatay and Özler (1995, p. 1883) could not detect a relationship between female labor force participation and inflation. In this study, inflation will be used as a control variable.

There are also studies examining in terms of variables in addition to the relevance of female labor force participation to economic development, female labor force participation depends on political-cultural (Doumato & Posusney, 2003, pp. 1-23), social-marital status (Fernández, 2013, pp. 497-498; Tyrowicz et al., 2018, p. 154) and religious-educational (Bussemakers et al., 2017, p. 28; King & Hill, 1993, p. 29).

Religion has negative effect on female labor force participation (Beit-Hallahmi, 1997, pp. 166-176; Tzannatos, 1999, pp. 551-569). Sharabi (1988), explains the reason for the negative effect on Muslim FLFP as the entry of female into the labor force by Islamic traditions. In fact, FLFP may be affected by lower levels of education, early marriage, or higher fertility in Muslim countries. In a different way, Ross (2008, p. 1) attributes the low FLFP to the fact that the income of Muslim countries is based on oil. In addition, female labor force participation in Muslim countries lower than non-Muslim countries (Amin & Alam, 2008; Bayanpourtehrani & Sylwester, 2013a; Clark & Adler, 1991; Marshal, 1985; Papanek, 1973; Youssef, 1974). Bayanpourtehrani and Sylwester (2013a, p. 749) in their study also found some evidence that the relationship between FLFP and religion weakens over time.

Religion and culture are one of the important factors which affecting female labor force participation. Amin and Alam (2008, p. 2368), compare the labor market behavior of Muslim females in Malaysia with that of Buddhist, Hindu and female of other religious faiths using Malaysian Family Life Survey data. The results of the study suggest that religion has a significant impact on female labor force participation which Buddhist and Hindu female labor force participation are significantly higher than Muslim female labor force participation. Bayanpourtehrani and Sylwester (2013b, p. 107) claim that Islam may not reduce FLFP according to the results of their study. The authors find that the relationship between Islam and FLFP is similar to that of Catholicism, but that FLFP is higher in countries where Protestantism is prevalent or where no religion is practiced. The study also found some evidence that the relationship between FLFP and religion weakens over time.

Religion is effective in female labor force participation in Muslim countries. The religion of Islam considers labor as sacred. The primary duty of Muslim males is to meet family material needs. Accordingly, in Muslim countries, females are included in the labor market due to negative economic conditions where males' income is not enough and then leaving the labor market in the period of better economic conditions. Females are considered to be physically naive, and not encouraged to work unless it is necessary. According to Islamic belief, men are protector of female, and must provide their needs (Surah an-Nisâ verse 34).

In this study, it is assumed that females in the Muslim countries are included in the labor market for economic reasons. Thus, the relationship between female labor participation and economic development in Muslim countries will be shaped as a Kuznets curve.

Especially in Muslim countries, female, who are kept in the secondary place, have been affected by factors such as gender, religion, and culture and have remained in the background compared to men in almost all the world. Looking at Islamic law, all females can work, and start a business. It is not an obstacle for them to freely save on the money there have earned. It can be said that Islam aims to protect universal morality and female. In this context, according to Islam, female can work in jobs that do not contradict social morality and religion. It is even known that Zainab and Khadija, the wives of Muhammad, the prophet of Islam, were engaged in trade and were craftswoman (Cevherli, 2022, p. 299; Yelkenci, 2019, p. 1).

Korotayev et al. (2015, p. 3), investigated the relationship between female labor participation and Islam and Arab culture using cross section data and regression model. The result show that religion and Arap culture has significantly negative effect on FLFP.

Also, effect of Arap culture more dominant than religion factor. In addition to the assumption that religion is behind female labor force participation in Arab geography, there are also studies claiming that high oil production is the cause (Ross, 2008, pp. 14-15). Considering that female predominantly work in the trade and textile sector, an increase oil price will reduce the importance of those sectors. As a result, while family income increases female wages decreases. Therefore, female prefer to stay at home and FLFP decrease.

## Data and Methodology

Consumer Price Index (CPI), Gross Domestic Product (GDP) and Female Labor Force Participation Rate (FLFP) variables are obtained from World Bank data. The countries in study are chosen from The Organization of Islamic Cooperation (OIC) based on countries which has more than 50% Muslim population and data availability. The study utilized data from 39 Islamic countries between 1990 and 2019, and the analysis was conducted using the Stata statistical software program. One of the study's limitations is the significant differences in the economic development levels of the countries analyzed. These disparities posed challenges both in accessing data and in interpreting the findings.

A four-stage econometric approach was used in the study. Accordingly, in the first step, the cross-sectional dependencies of the variables were examined using CD tests by Breusch and Pagan (1980) and Pesaran (2004).

$$\text{CDLM1}=\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{p}_{ij}^{2}\text{ , CDLM2: }\sqrt{\frac{1}{N(N-1)}}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}(T\hat{p}_{ij}^{2}-1)\text{ , and}$$

$$\text{CD: }\sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{p}_{ij}^{2}\right) \quad \textbf{(1)}$$

The results reported in Table 1 show that all variables and models contain cross-sectional dependencies.

In the second step, the stationarity degrees of the variables were examined using the Pesaran (2007) CIPS unit root test.

$$\text{CIPS}=N^{-1}\sum_{i=1}^{N}\tilde{t}_{i} \quad \textbf{(2)}$$

According to the results reported in Table 2, all variables have a unit root at the level and are stationary in the first differences. In other words, all variables are I (1).

In the third step, the existence of a long-run relationship regarding the model was investigated using the Westerlund (2007) panel cointegration test.

$$DH_g = \sum_{i=1}^{n} \hat{S}_i \left(\tilde{\varnothing}_i - \hat{\varnothing}\right)^2 \sum_{t=2}^{T} \hat{e}_{it-1}{}^2$$
$$DH_p = \hat{S}_n \left(\tilde{\varnothing}_i - \hat{\varnothing}\right)^2 \sum_{i=1}^{n} \sum_{t=2}^{T} \hat{e}_{it-1}{}^2 \quad \textbf{(3)}$$

According to the results reported in Table 3, cointegration was detected according to both test statistics.

The coefficients related to the cointegration relationship detected in the last step were obtained using the augmented mean group (AMG) developed by Eberhardt and Teal (2010) and the common correlated effects test developed by Pesaran (2006). (CCE) estimators were used. The results are reported in Table 4.

## Results

**Table 1. Cross-Section Dependence Test**

| Variables | CDLM1 | CDLM2 | CD |
|---|---|---|---|
| CPI | 18109.17*** | 451.1594*** | 133.8629*** |
| GDP | 11187.26*** | 271.3544*** | 67.46486*** |
| $GDP^2$ | 11237.58*** | 272.6614*** | 67.57837*** |
| LF | 8674.160*** | 206.0735*** | 4.880696*** |
| LF1 | 8583.428*** | 203.7166*** | 0.254154 |
| LF2 | 10436.36*** | 251.8488*** | 2.160557** |
| LF-2 | 9623.325*** | 230.7292*** | -0.363323 |
| Model-LF1 | 14389.33*** | 354.5319*** | -0.201963 |

*** and ** indicate the rejection of the null hypothesis at 1% and 5% significance levels

Table 1. shows that there is cross section dependence in all variables.

**Table 1. CIPS panel unit root test results**

| Variables | Level | First differences |
|---|---|---|
| GDP | -2.404 | -4.824*** |
| $GDP^2$ | -2.330 | -4.754*** |
| CPI | -2.403 | -4.576*** |
| LF | -1.635 | -3.059*** |
| LF2 | -1.092 | -3.317*** |

*** and ** indicate the rejection of the null hypothesis at 1% and 5% significance levels

Table 2. shows that there is unit root of first difference.

**Table 2. Panel cointegration tests results**

| Tests | Value | P value |
|---|---|---|
| Westerlund (2008) | | |
| dh_g | 18.531*** | 0.000 |
| dh_p | 25.672*** | 0.000 |

***indicates the rejection of the null hypothesis at 1% significance levels.

Table 3. shows that there is cointegration between the variables.

**Table 3. Economic Growth and Female Labor Participation in Islamic Countries**

| Countries | Model | LF-1 | GDP | GDP2 | CPI | FLEKC |
|---|---|---|---|---|---|---|
| Albania | AMG | .495*** | -.213 | .014 | .004 | Not Valid |
| | CCE | .486* | -.856 | .068 | .027 | Not Valid |
| Algeria | AMG | .046 | -40.216*** | 2.525*** | .100** | U shape |
| | CCE | -.118 | -47.645*** | 2.920*** | .327*** | U shape |
| Azerbaijan | AMG | .000 | -.493*** | .030*** | -.003** | U shape |
| | CCE | .028 | -.816*** | .050*** | -.005*** | U shape |
| Bangladesh | AMG | .003 | -1.493*** | .118*** | .152*** | U shape |
| | CCE | -.067** | 2.055 | -.116 | .127** | Not Valid |
| Bahrain | AMG | .065 | -9.690 | .501 | -.106*** | Not Valid |
| | CCE | .265 | -64.218 | 3.231 | -.170 | Not Valid |
| Egypt | AMG | .565*** | -2.534 | .185 | -.102 | Not Valid |
| | CCE | .550*** | -38.293 | 2.372 | -.323** | Not Valid |
| Indonesia | AMG | .028 | -2.869* | .190* | -.041 | U shape |
| | CCE | .159 | -4.159 | .257 | -.127 | Not Valid |
| Iran | AMG | .136*** | 35.703*** | -2.100*** | -.032* | Valid |
| | CCE | .732*** | 27.567** | -1.588** | .237*** | Valid |
| Iraq | AMG | .428*** | -2.504** | .147** | .015 | U shape |
| | CCE | .433** | 1.530 | -.094 | .051 | Not Valid |
| Jordan | AMG | .192 | -27.518** | 1.664** | .311*** | U shape |
| | CCE | .289 | -16.714 | 1.026 | .381 | Not Valid |
| Kazakhstan | AMG | -.003 | .708*** | -.041*** | .000 | Valid |
| | CCE | -.006 | .451 | -.026 | .002 | Not Valid |
| Lebanon | AMG | .489*** | 11.208** | -.618** | -.000 | Valid |
| | CCE | .630*** | 12.269* | -.681* | -.032 | Valid |
| Malaysia | AMG | .123*** | -5.584*** | .324*** | -.198 | U shape |
| | CCE | .236 | -5.224* | .295* | .023 | U shape |
| Morocco | AMG | .083** | 16.120*** | -1.049*** | .180* | Valid |
| | CCE | .094 | 12.291*** | -.820*** | -.342 | Valid |
| Oman | AMG | .432*** | -107.014*** | 5.427*** | -.461*** | U shape |
| | CCE | .810*** | -68.569* | 3.463* | -.143 | U shape |
| Pakistan | AMG | .574*** | 22.695*** | -1.594*** | .083* | Valid |
| | CCE | .289* | 14.524 | -1.065 | -.008 | Not Valid |
| Saudi Arabia | AMG | .083** | -8.866 | .461 | .070 | Not Valid |
| | CCE | .502*** | -15.746 | .821 | .033 | Not Valid |
| Turkey | AMG | .028 | -18.677*** | 1.044*** | -.033 | U shape |
| | CCE | .314** | -18.594*** | 1.028*** | -.131*** | U shape |
| Tunisia | AMG | .042 | 1.147 | -.057 | .026 | Not Valid |
| | CCE | .275** | 5.674* | -.356* | -.046 | Valid |
| Yemen | AMG | 1.088*** | 3.174 | -.215 | .052 | Not Valid |
| | CCE | .943*** | -6.958** | .450* | -.091*** | U shape |
| United Arab Emirates | AMG | .895*** | -29.443*** | 1.388*** | .328*** | U shape |
| | CCE | .980*** | -4.804 | .212 | -.371*** | Not Valid |
| Brunei Darussalam | AMG | .020 | -14.280 | .687 | -.014 | Not Valid |
| | CCE | .169*** | -2.917 | .135 | -.033 | Not Valid |
| Burkina Faso | AMG | .172*** | -5.439*** | .427*** | -.008 | U shape |
| | CCE | .648*** | -1.652 | .130 | .115*** | Not Valid |
| Chad | AMG | .855*** | .150 | -.012 | -.008 | Not Valid |
| | CCE | .885*** | .035 | -.002 | -.002 | Not Valid |
| Gambia | AMG | .731*** | 1.698 | -.129 | .008*** | Not Valid |
| | CCE | .940*** | 2.043 | -.155 | -.007* | Not Valid |

Table 4 …

| Countries | Model | LF-1 | GDP | $GDP^2$ | CPI | FLEKC |
|---|---|---|---|---|---|---|
| Guinea | AMG | -.034*** | -.259 | .019 | .004*** | Not Valid |
| | CCE | .005 | .129 | -.009 | .006*** | Not Valid |
| Kyrgyz Republic | AMG | .150** | 2.404*** | -.188*** | -.005 | Valid |
| | CCE | .527*** | 1.044 | -.081 | .004 | Not Valid |
| Maldives | AMG | .067 | 37.161*** | -2.122*** | -.082 | Valid |
| | CCE | .963*** | -8.161 | .462 | -.062 | Not Valid |
| Mali | AMG | -.004 | 2.940*** | -.233*** | -.019 | Valid |
| | CCE | -.097** | 2.522 | -.198 | -.008 | Not Valid |
| Mauritania | AMG | -.000 | 3.199*** | -.221*** | .035*** | Valid |
| | CCE | .042 | 2.590 | -.179 | .014 | Not Valid |
| Niger | AMG | -.023* | 1.229 | -.115 | -.021 | Not Valid |
| | CCE | .054 | 1.822 | -.156 | .012 | Not Valid |
| Nigeria | AMG | .345*** | .397 | -.026 | -.018*** | Not Valid |
| | CCE | .672*** | -.149 | .012 | -.027** | Not Valid |
| Senegal | AMG | .068 | 7.390 | -.492 | .245*** | Not Valid |
| | CCE | .589*** | 10.314* | -.722* | .006 | Valid |
| Uzbekistan | AMG | -.020 | -.218*** | .009*** | -.000*** | U shape |
| | CCE | .116*** | -.438*** | .023*** | 1.57 | U shape |
| Sierra Leone | AMG | -.027 | -.044 | .002 | .002 | Not Valid |
| | CCE | .039 | .266 | -.020 | .016** | Not Valid |
| Sudan | AMG | -.017 | 5.161* | -.360* | .022*** | Valid |
| | CCE | .029 | .336 | -.022 | .009** | Not Valid |
| Tajikistan | AMG | .400*** | -1.266*** | .100*** | .003 | U shape |
| | CCE | .652*** | -.390 | .030 | -.012 | Not Valid |
| Turkmenistan | AMG | -.000 | -.432*** | .024*** | -.000*** | U shape |
| | CCE | .034*** | -.422*** | .023*** | -.000* | U shape |
| Comoros | AMG | .324*** | 24.553** | -1.740** | -.071*** | Valid |
| | CCE | 1.049*** | -7.380 | .534 | .045 | Not Valid |
| PANEL | AMG | .225*** | -2.615 | .101 | .010 | Not Valid |
| | CCE | .388*** | -5.555* | .288* | -.012 | U shape |

*** and ** indicate the rejection of the null hypothesis at 1%, 5% and 10% significance levels

Result from panel data shows that there is a U-shaped relationship between economic development and FLFP in CCE model.

On the country level AMG model shows that FLFP has a U-shaped relationship with economic development for Algeria, Azerbaijan, Bangladesh, Indonesia, Iraq, Jordan, Malaysia, Oman, Turkey, UAE, Burkina Faso, Uzbekistan, Tajikistan and Turkmenistan. In contrast, FLFP has inverted U-shape (Kuznets curve) relationship with economic development for Iran, Kazakhstan, Lebanon, Morocco, Pakistan, Kyrgyz Republic, Maldives, Mali, Mauritania, Sudan and Comoros.

While CCE model shows that FLFP has a U-shaped relationship with economic development for Algeria, Azerbaijan, Indonesia, Malaysia, Oman, Turkey, Yemen, Uzbekistan and Turkmenistan, FLFP has inverted U-shape (Kuznets curve) relationship with economic development for Iran, Lebanon, Morocco, Tunisia and Senegal.

## Conclusions and Discussion

This paper investigated Kuznets curve relationship between the female labor participation rate and the process of economic development in 39 Islamic countries using data from 1990 to 2019. While Kuznets curve was detected in at least one model in Iran, Kazakhstan, Lebanon, Morocco, Pakistan, Kyrgyz Republic, Maldives, Mali, Mauritania, Sudan, Tunisia, Senegal, and Comoros, U shaped hypothesis confirms at least one model in Algeria, Azerbaijan, Bangladesh, Indonesia, Iraq, Jordan, Malaysia, Oman, Türkiye, Yemen, UAE, Burkina Faso, Uzbekistan, Tajikistan, and Turkmenistan.

In contrast to the general feminization U theory, some Islamic countries represent Kuznets curve. The religion, culture, and legal codes should be the reason behind the Kuznets curve. Since Iran, Mauritania and Sudan are governed by Islamic laws, there are restrictions on female labor force participation in the workforce. Pakistan, Tunisia, Maldives, Comoros, and Morocco are governed partially by Islamic laws. Interior conflicts in Mali, Senegal, and Lebanon hinder female participation in social life and the workforce. Therefore, while female in these countries participate in the labor force due to their economic needs, they withdraw from the labor force as their income increases. This explains the reason behind the result of Kuznets curve for the above country group.

The feminization of the labor force in certain countries, such as Algeria, Azerbaijan, Bangladesh, Indonesia, Iraq, Jordan, Malaysia, Oman, Turkey, Yemen, UAE, Burkina Faso, Uzbekistan, Tajikistan, and Turkmenistan, is often referred to as the "U feminization theory." These countries, which are typically secular, tend to see an increase in female labor force participation as income levels rise. As income increases, local females are more likely to be employed in the public sector, while foreign females are more likely to be employed in the private sector. This trend is particularly prominent in the Gulf Arab countries.

It is challenging to identify a single factor that affects female labor in Islamic countries due to the varying levels of economic development and cultural structures (although there are commonalities in Islam and religion). The development of different industries, such as agriculture, industry, and service sectors, affects female participation in the business world in these countries. Religion is not the main factor influencing female labor, but the legal system and general family structure (i.e., local culture) do affect female entry into the workforce in some cases. In the Gulf countries, the high presence of foreign workers (Bahrain, UAE, in the labor market makes it difficult to isolate the factors affecting female inclusion in the workforce.

Encouraging female participation in the labor force can support development in the region. To achieve this, cultural and political barriers that prevent female from joining the workforce must be removed. By creating work environments that do not negatively impact female family lives, it is likely that more female will be included in the labor market.

This study, which assumes that the U-shape observed in pre-industrial and post-industrial societies is distinct in Islamic countries, identified the presence of the Kuznets curve in some of these nations. Based on the findings, future research could explore the female labor force participation rates in countries that deviate from the study's claims.

Such studies could compare factors like religion, culture, legal frameworks, and the political environment to provide deeper insights.

| | |
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