Studies on Balkan and Near Eastern Social Sciences Yilmaz/Löschnigg (eds.)

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Salih Türedi[1] and Harun Terzi[2]

# The Relationship between Education and Democracy in Turkey

## Introduction

The determinants and effects of democracy have been among the basic research areas of the political economy literature. The relationship between education and democracy is also one of the intensely debated issues within this context. Although this topic was first addressed from a philosophical perspective by John Dewey (1916) in his study entitled "Democracy and Education", the first systematic study of it was carried out by Lipset (1959) using an approach referred to as "modernization hypothesis" or "Lipset's hypothesis." Such an approach deems a country's economic development level, and especially its educational level, to be a compulsory prerequisite of a sustainable and stable democracy. Lipset (1959) expressed this view as follows: "Education presumably broadens individuals' outlooks, enables them to understand the need for norms of tolerance, restrains them from adhering to extremist and monistic doctrines, and increases their capacity to make rational electoral choices. If we cannot say that a "high" level of education is a sufficient condition for democracy, the available evidence does suggest that it comes close to being a necessary condition in the modern world" (Lipset, 1959: 79–80). Ultimately, Lipset's hypothesis considers education as an instrument for creating democratic individuals and society.

The theoretical literature based on Lipset's hypothesis deals with the effect of education on democracy within the framework of the arguments of civic consciousness, political participation, tolerance (democratic attitudes and behaviors), and social equality (Alemán and Kim, 2015: 1; Hillygus, 2015: 25). Education is a determinant of political participation, which is one of the characteristics of a strong and efficient democracy. Accordingly, education strengthens civic consciousness among individuals by providing them with democratic knowledge, skills, and attitudes, thereby increasing their participation in political

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decision-making processes (i.e., political participation) (Lutz et al., 2010: 253; Berinsky and Lenz, 2011: 357–358). Education also plays an important role in providing society with tolerant and democratic individuals, and creating a democratic culture. A democratic individual can be defined as an individual who has a free and independent judgment; respects different beliefs, ideas, and values; is responsible; and defends rights and freedoms (Biesta, 2007: 740; Alemán and Kim, 2015: 1–2; Kıroğlu et al., 2012; 89). In addition, some studies have emphasized that education improves democracy by contributing to social equality. According to this approach, a close relationship exists between educational level and access to education and income inequality. As the educational level rises, individuals earn a higher income, thereby decreasing income inequality in society (Alemán and Kim, 2015: 1–2). As Stiglitz (1973: 136) states, the traditional view takes education as "a process involving the acquisition of skills or the inculcation of better work habits which increase the individual's productivity" and claims that "Since income is related to productivity, the more education an individual has, the higher will be his income." Therefore, policymakers regard educational expenditures as one of the quite effective policy instruments in ensuring social equality (by decreasing income inequality), which is one of the requirements of a democratic regime (Gregorio and Lee, 2002: 395).

On the other hand, the effect of education on democratization may vary depending on countries' development and welfare (income) levels. Accordingly, the above-mentioned effect of education on democratization is stronger in poor countries with a low-income level. In other words, the marginal utility of education is higher in poor countries and decreases as income level increases. This occurs because the existence of high-quality teachers and closeness to school are of importance and a priority for families that cannot afford to send their children to private schools or abroad for education (Edenbrandth, 2010: 5). On the other hand, economic and social conditions are already suitable enough to offer quality, sustainable, and mass education to individuals in those countries where income levels — and, thus, welfare levels — are high (Sanborn and Thyne, 2014: 774; Alemán and Kim, 2015: 1–2). In this sense, it can be said that education improves democratization by contributing to the equality of opportunities, especially in poor underdeveloped or developing countries.

The relationship between education and democracy can be treated within the framework of political regimes as well. Considerable differences have been observed between autocratic countries and countries with advanced democratic standards in terms of educational level. Although a democratic regime allows individuals to call on politicians to account for the decisions they make, accountability

is only for elite groups in autocratic regimes. Hence, politicians who are elected by voters in democratic regimes have to develop policies fitting voters' demands in order to be re-elected. In this regard, as parents consider education to be very important for their children's future, democratic countries allocate more resources for education, thereby ensuring a higher educational level (Keefer and Khamani, 2004; Edenbrandth, 2010: 5). It is just the contrary in autocratic regimes. As a primary goal is to ensure the security of the regime in such countries, public resources are used for military and security purposes rather than to improve the welfare of society (Bellin, 2004: 148). Consequently, the rulers of autocratic countries are unwilling to make educational investments as they have the potential to undermine the sustainability of the regime and, thus, their sovereignty. That is to say, education is not a priority area financed by public funding in autocratic regimes (Sanborn and Thyne, 2014: 775).

The following conclusions are reached when the theoretical literature concerning the education–democracy relationship is generally evaluated:

A mutual relationship exists between education and democracy.

Education contributes to democracy, especially in those countries where income levels are low.

A country's political regime type is a determinant of its educational level.

Democratic countries have higher educational levels than autocratic countries.

The present study investigated the causality relationship between education and democracy. To this end, annual time series data about Turkey covering the 1972–2012 period were used. The econometric analyses yielded empirical evidence indicating the existence of a statistically significant two-way causality relationship between education and democracy in Turkey. Economically, this result can be interpreted that education will contribute to the democratization of Turkey by providing the society with democratic individuals who have civic consciousness, respect opposing views and ideas, and defend freedoms. Additionally, improvements in democratic rights and freedoms will make a significant contribution to Turkey's transformation into a country with a high educational level.

## Literature Review

The relationship between education and democracy is one of the main issues underlying today's academic and political debates. Although the theoretical research on this subject dates back to the early 20$^{th}$ century, there has been an increase in the number of empirical studies in recent years. Mostly cross-sectional and

panel data approaches have been used in these studies. However, the findings vary in terms of estimation methods, variables, and countries' development levels, income levels, and ruling regimes; thus, no consensus on this matter exists in the empirical literature. On the other hand, studies about Turkey in the domestic (Turkish) literature have mostly discussed the relationship between education and democracy at the theoretical level; no empirical study has dealt with the issue at the macro level. In this regard, the present study is the first empirical study investigating the relationship between education and democracy in Turkey. This section chronologically presents the previous studies conducted on this subject.

Brown (1999) examined 136 countries with different regimes (e.g., democracy, autocracy) and development levels and found that democracy has a positive and strong effect on education (primary education schooling rate), but the degree of such an effect varies depending on the country's development level. Although democracy affects education in the strongest way in underdeveloped countries where the income level is particularly low, the degree of such an effect decreases as the economic development level rises. Investigating the determinants of democracy in 100 countries with different development levels, Barro (1999) determined that no statistically significant relationship exists between secondary education and higher education schooling rate and democracy, but primary education schooling rate is a determinant of democracy. Baum and Lake (2003) classified countries with less income per capita than $2500 as poor countries and countries with more income per capita than $2500 as non-poor countries, carried out a study in 128 countries and tested the relationship between democracy and human capital (life expectancy and secondary education schooling rate). The results of the time-series and cross-sectional data analyses conducted for this purpose showed that democracy increases life expectancy in poor countries and secondary education school rate in non-poor countries. Mulligan et al. (2004) conducted a cross-sectional analysis for 142 countries, but could not demonstrate the influence of democracy on public educational spending. Using a standard panel least squares test, Glaeser et al. (2004) found evidence indicating that period of study is one of the causes of the differences between democratic development levels. Exploring the relationship between education and democracy, Acemoğlu et al. (2005) claimed that the previous studies investigating this relationship using cross-sectional and panel data methods (Barro, 1999; Przeworski, 2000; Glaeser et al., 2004) had ignored the intercountry differences and, thus, obtained biased results. They conducted a two-stage estimation process to indicate its correctness. First, they performed a pooled least squares test by assuming that the countries they included in the model were homogenous, thereby determining that education (the average period of study of

the population at the age of 25 or over) has a significant positive effect on democracy (political rights and civil freedoms). Second, they repeated the estimation via fixed effects and Generalized Method of Moments (GMM) tests, taking into account the individual differences between the countries, thereby determining that no significant relationship exists between these variables. Contrary to Acemoğlu et al. (2005), Bobba and Coviello (2006) and Climent (2008) found that education positively affects democracy and country effect (individual differences) does not change this result.

In the study carried out for eight East Asian countries (South Korea, the Philippines, Singapore, Malaysia, Thailand, Taiwan, Hong Kong, and Indonesia), Chen (2008) found that democracy increases educational spending and schooling rates. Morales et al. (2013) investigated the economic, demographic, political, and institutional factors affecting public education expenditures in 33 Organization for Economic Cooperation and Development (OECD) countries and concluded that the progress achieved in civil freedoms and political rights (i.e., improvement of democracy), which are among the institutional factors, increases public educational spending. In their study covering the 1955–2010 period and employing a panel data set consisting of 5-year observations, Alemán and Kim (2015) estimated the relationship between education and democracy in some high-income developed countries (i.e., OECD countries) and some low-income countries. The analysis using GMM indicated that an increase in educational level positively affects the democracy level in both country groups, although such an effect is stronger in low-income countries (especially Afghanistan, Bangladesh, Haiti, Nepal, and most Sub-Saharan Africa countries). According to Smith's (2015) study covering 103 countries, a positive and significant relationship exists between democratic transition (transition from autocracy to democracy) and educational level. Therefore, countries have to make more educational investments so that democratic institutions can be developed. Referring to the common belief that democracy is the best regime that allows individuals to improve their knowledge and skills by broadening their access to education, Knutsen and Dahlum (2015) conducted a panel data analysis of 128 countries and found that, contrary to common belief, democracy does not have any effect on improving the quality of education.

## Data

In the analysis using annual data from 1972 to 2012, education (Edu) was defined as the number of graduated students (from university) whereas democracy (Dem) was defined as the average of the indices of PR (Political Rights) and CL (Civil Liberties) created by Freedom House. Data concerning the number of graduated

students were compiled from the Ministry of National Education of Turkey (MEB) and the Turkish Statistical Institute (TUİK); data concerning the democracy index were compiled from the statistics on Freedom House's website.

## Methodology and Findings

To make correct estimations of the relationships among variables in econometric analyses[3], the time-series characteristics of these variables first have to be determined. Thus, an augmented Dickey-Fuller (ADF) test, which was developed by Dickey-Fuller (1979) and in which the lagged values of the dependent variable were added to the right side of the equation to eliminate the probable autocorrelation problem, and a Phillips-Perron (1988) (PP) unit root test were administered. For the estimation of the regression equation without autocorrelation, the Schwarz information criterion (SIC) was used in both tests. For ADF and PP tests, if the *t* statistic and α coefficient estimated in equations (1) and (2) were negative and significant, according to MacKinnon's table of critical values, $h_0$ (non-stationary series) was rejected.

$$\Delta Y_t = a + \alpha Y_{t-1} + \sum_{i=1}^{m} b_i \Delta Y_{t-i} + u_t \quad (1)$$

$$\Delta Y_t = c + dTrend = \alpha Y_{t-1} + \sum_{i=1}^{n} e_i \Delta Y_{t-i} + u_t \quad (2)$$

The unit root test results in Table 1 show that the (Edu) and (Dem) series contain unit roots at their levels, but become stationary when their first differences are considered.

*Table 1: The Results of Unit Root Test*

| Variables | | ADF Test | | PP Test | |
|---|---|---|---|---|---|
| | | Constant | Constant-Trend | Constant | Constant-Trend |
| Edu | Level | (4) -0.204 | (2) -3.775[b] | (5) -0.329 | (5) -2.588 |
| Dem | | (2) -2.713[c] | (1) -2.668 | (3) -2.387 | (3) -2.390 |
| Edu | First Difference | (5) -5.145[a] | (5) -5.647[a] | (4) -6.598[a] | (4) -6.506[a] |
| Dem | | (0) -5.196[a] | (0) -5.134[a] | (3) -5.133[a] | (3) -5.061[a] |

a, b, and c represent statistical significance at the 1%, 5%, and 10% levels, respectively.

3 Eviews and Gretl softwares have been used for the econometric analysis.

## Sims and Modified Sims Tests

Sims (1972), who improved Granger's (1969) causality test, estimated regression equations (3) and (4) by adding the leading variables of the explanatory variable to Granger's equations.

$$Dem_t = a + \sum_{i=1}^{m} b_i Dem_{t-i} + \sum_{i=1}^{n} c_i Edu_{t-i} + \sum_{i=1}^{p} d_i Edu_{t+i} + u_{1t} \quad (3)$$

$$Edu_t = e + \sum_{i=1}^{q} f_i Edu_{t-i} + \sum_{i=1}^{r} g_i Dem_{t-i} + \sum_{i=1}^{s} h_i Dem_{t+i} + u_{2t} \quad (4)$$

According to Sims, who formulized the direction of causality from the dependent variable to the independent variable, which contradicts Granger's causality test, a causality exists from (Dem) to (Edu) if $h_0$: $d_i=0$ is rejected in equation (3); a causality exists from (Edu) to (Dem) if $h_0$: $h_i=0$ is rejected in equation (4); and a two-way causality exists if $h_0$: $d_i=0$ and $h_0$: $h_i=0$ are rejected together (Gujarati and Porter, 2009).

Geweke, Meese, and Dent (1983) carried out a modified Sims' test by starting the leading variables of the explanatory variable from (0) rather than (1), as in equations (5) and (6). Here, a causality exists from (Dem) to (Edu) if $h_0$: $d_i=0$ is rejected in equation (5); a causality exists from (Edu) to (Dem) if $h_0$: $h_i=0$ is rejected in equation (6); and a two-way causality exists if $h_0$: $d_i=0$ and $h_0$: $h_i=0$ are rejected together.

$$Dem_t = a + \sum_{i=1}^{m} b_i Dem_{t-i} + \sum_{i=1}^{n} c_i Edu_{t-i} + \sum_{i=0}^{p} d_i Edu_{t+i} + u_{1t} \quad (5)$$

$$Edu_t = e + \sum_{i=1}^{q} f_i Edu_{t-i} + \sum_{i=1}^{r} g_i Dem_{t-i} + \sum_{i=0}^{s} h_i Dem_{t+i} + u_{2t} \quad (6)$$

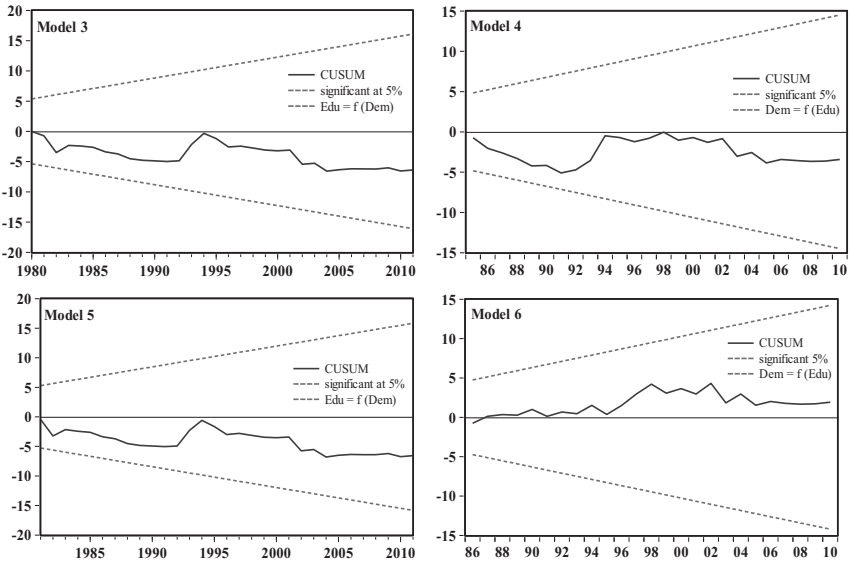
According to the results of the Sims' and modified Sims' causality tests administered to the stationary series not containing unit root in Table 2, a two-way causality relationship exists between (Edu) and (Dem), with a significance level of 1% from (Dem) to (Edu) and 10% from (Edu) to (Dem). LM, BPG, and Cusum tests for Models 3, 4, 5, and 6 show that the models do not include autocorrelation, heteroscedasticity, or structural instability problems.

*Table 2: The Results of Sims and Modified Sims Test*

| Models | F-statistics | Causality | LM statistics | BPG statistics |
|---|---|---|---|---|
| 3. Dem=f(Dem(-1),Edu(-2), Edu(1)) | 12.581[a] [0.001] | (Dem)→(Edu) | 1.077 [0.353] | 0.700 [0.597] |
| 4. Edu=f(Edu(-3),Dem (-3), Dem(2)) | 3.296[c] [0.053] | (Edu)→(Dem) | 0.460 [0.712] | 1.486 [0.210] |
| 5. Dem=f(Dem(-1), Edu(-2), Edu(1)) | 6.131[a] [0.005] | (Dem)→(Edu) | 1.098 [0.346] | 1.107 [0.376] |
| 6. Edu=f(Edu(-3), Dem (-3), Dem(2)) | 2.732[c] [0.065] | (Edu)→(Dem) | 1.434 [0.259] | 0.936 [0.511] |

(..); indicates optimal lag lenght, [..]; indicates probability values of test statistics, and a and c represent statistical significance at the 1%, and 10% levels, respectively. LM; Breusch-Godfrey autocorrelation test. BPG; Breusch-Pagan-Godfrey heteroskedasticity test.

*Figure 1: CUSUM Graphics for Model 3, 4, 5 and 6*




## Dolado-Lütkepohl (DL) VAR Causality Test

Dolado-Lütkepohl (1996) did not take the stationarity levels and cointegration relationships of the variables into consideration, which is a different approach from the standard VAR causality test recommended for testing causality, in which

the additional lag length is added to the optimal lag length of the VAR model established at its level. In the DL-VAR causality test, after determining the optimal lag length for equations (7) and (8), as indicated in Table 4 (k=4), the DL-VAR (k+1=5) model was estimated using the ordinary least squares (OLS) and seemingly unrelated regression (SUR) methods.

The DL-VAR method compare to the Toda Yamamoto (TY) VAR method prefers application of $d_{max}$=1. Because $d_{max}$=1 offers better estimation than the other orders of $d_{max}$. So, the DL-VAR is estimated by the lag length at 5, but the MWALD test is applied on the first k variables instead of all variables in the DL-VAR(k+1=5) model. To determine the direction of causality in the following equations (7) and (8), the MWALD test was administered for determining whether the *k* coefficients of the independent variables were statistically significant. To joint test the DL-VAR causality by the MWALD test between the (Edu) and (Dem) the hypothesis can be constructed that (Dem) does not cause (Edu): $h_0$: $a_{12}^{(1)} = a_{12}^{(2)} = a_{12}^{(3)} = a_{12}^{(4)} = 0$ and (Edu) does not cause (Dem), constructed as $h_0$: $a_{21}^{(1)} = a_{21}^{(2)} = a_{21}^{(3)} = a_{21}^{(4)} = 0$ . As shown in Table 5, $h_0$ hypotheses were rejected at the 1% significance level, and a two-way causality relationship was identified between (Edu) and (Dem).

$$\begin{bmatrix} Edu_t \\ Dem_t \end{bmatrix} = \begin{bmatrix} a_{01} \\ a_{02} \end{bmatrix} + \begin{bmatrix} a_{11}^1 & a_{12}^1 \\ a_{21}^1 & a_{22}^1 \end{bmatrix} \begin{bmatrix} Edu_{(t-1)} \\ Dem_{(t-1)} \end{bmatrix} + \ldots\ldots + \begin{bmatrix} a_{11}^5 & a_{12}^5 \\ a_{21}^5 & a_{22}^5 \end{bmatrix} \begin{bmatrix} Edu_{(t-5)} \\ Dem_{(t-5)} \end{bmatrix} + \begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix} \quad (7)$$

(8)

*Table 4: Optimal Lag Length of the DL-VAR Model*

| Lags | LR | FPE | AIC | SIC | HQ |
|---|---|---|---|---|---|
| 0 | NA | 0.521 | 5.024 | 5.112 | 5.054 |
| 1 | 135.113 | 0.010 | 1.152 | 1.416 | 1.244 |
| 2 | 14.694 | 0.008 | 0.900 | **1.340*** | 1.053 |
| 3 | 6.958 | 0.008 | 0.882 | 1.498 | 1.097 |
| 4 | **10.154*** | **0.007*** | **0.728*** | 1.520 | **1.005*** |
| 5 | 5.048 | 0.008 | 0.7491 | 1.716 | 1.086 |

*; indicates optimal lag length.

*Table 5: The Results of DL-VAR Causality Test (k+1)=(4+1)*

| Models | $\chi^2$ (OLS) | $\chi^2$(SUR) | LB-Q (5) | ARCH (5) | Causality |
|---|---|---|---|---|---|
| 7. Edu=f (Dem) | 15.684[a] [0.003] | 22.585[a] [0.000] | 2.409 [0.79] | 5.842 [0.32] | (Dem)→(Edu) |
| 8. Dem=f (Edu) | 10.593[b] [0.03] | 15.254[a] [0.004] | 1.624 [0.90] | 0.645 [0.99] | (Edu)→(Dem) |

a, and b represent statistical significance at the 1%, and 5% levels, respectively. Portmanteau test LB(9)=22.3 [0.13], Doornik-Hansen test Chi-square (4)=7.60 [0.11], JB statistics=6.20 [0.18].

As the characteristic polynomial reverse roots were inside the unit circle, the DL-VAR model fulfilled the stability condition. The coefficient of correlation between the error terms is 0.16, and the coefficient of covariance between (Dem) and (Edu) is 0.01. In the OLS and SUR estimations in Figure 1, the CUSUM test does not involve a structural break. All the diagnostic tests concerning the VAR model show that the optimal lag length is appropriate, and the model fulfills the required assumptions.

## Conclusion and Recommendations

The theoretical literature on the education–democracy relationship highlights that a mutual relationship exists between these variables. Accordingly, although education is the prerequisite of an efficient and sustainable democracy (Lipset's hypothesis), democracy improves the educational level by broadening opportunities to access education. The main purpose of the present study is to determine whether this mutual relationship is true for Turkey as well. In this regard, three different causality tests (Sims, Modified Sims, and Dolado-Lütkepohl) were applied in the present study of Turkey for the 1972–2012 period. The empirical findings provide evidence supporting the relevant theoretical approach (i.e., the existence of mutual causality between education and democracy). Hence, it can be said that education is quite an important area that should not be ignored by policymakers if Turkey is to become a modern, freedom-based, participatory, and sustainable democratic country. On the other hand, it should be remembered that practices for improving the educational level of a society (e.g., the rate of literacy, schooling rate, access to education) would be more effective when supported by democratic rights and freedoms.

## References

Acemoglu, D., Johnson, S., Robinson, A. J. and Yared, P. (2005). "From Education to Democracy", The American Economic Review, 95(2), 44–49.

Alemán, E. and Kim, Y. (2015). "The Democratizing Effect of Education", Research & Politics, 1–7.

Barro, R. J. (1999). "The Determinants of Democracy", Journal of Political Economy, 107(S6): 158–183.

Baum, M. A. and Lake, D. A. (2003). "The Political Economy of Growth: Democracy and Human Capital", American Journal of Political Science, 47(2): 333–347.

Bellin, E. (2004). "The Robustness of Authoritarianism in the Middle East: Exceptionalism in Comparative Perspective", Comparative Politics, 36(2): 139–157.

Biesta, G. J. J. (2007). "Education and the Democratic Person: Towards a Political Understanding of Democratic Education". Teachers College Record 109(3): 740–769.

Bobba, M. and Coviello, D. (2006). "Weak Instruments and Weak Identification in Estimating the Effects of Education on Democracy", Inter-American Development Bank, Research Department, Working Paper No. 569.

Berinsky, J. A. and Lenz, S. G. (2011). "Education and Political Participation: Exploring the Causal Link", Polit Behav, 33: 357–373.

Brown, D. S. (1999). "Reading, Writing, and Regime Type: Democracy's Impact on - Primary School Enrollment", Political Research Quarterly, 52(4): 681–707.

Chen, J. (2008). "Democratization and Government Education Provision in East Asia", Journal of East Asian Studies, 8: 175–209.

Cliement, C. A. (2008). "On the Distribution of Education and Democracy", Journal of Development Economics, 87: 179–190.

Dewey, J. (1916). *Democracy and Education*: An Introduction to the Philosophy of Education, New York, Macmillan.

Dickey, D. and Fuller, W. A. (1979). "Distribution of the Estimators for Autoregressive Time Series with a Unit Root", Journal of the American Statistical Association, 74: 427–431.

Dolado, J. and Lütkepohl, H. (1996). "Making Wald Tests Work for Co-integrated VAR Systems", Econometric Reviews, 15: 369–386.

Edenbrandth, A. (2010). "Does Democracy Promote Education? An Empirical Study on the Impact Democracy has on Education Levels in a Country, (http://lup.lub.lu.se/student papers/record/1544971/file/1647148.pdf).

Geweke, J., Meese, R. and Dent, W. (1983). "Comparing Alternative Tests of Causality in Temporal Systems: Analytic Results and Experimental Evidence", Journal of Econometrics, 21(2): 161–194.

Glaeser, L. E., Porta, L. R., Silanes, L, F. and Shleifer, A. (2004). "Do Institutions Cause Growth?", Journal of Economic Growth, 9(3): 271–303.

Granger, C. W. J. (1969). "Investigating Causal Relations by Econometric Models and Cross-spectral Methods", Econometrica, 37(3): 424–443.

Gregorio, J. D. and Lee, J. W. (2002). "Education and Income Inequality: New Evidence from Cross-country Data", Review of Income and Wealth, 48(3): 395–416.

Gujarati, D. N. and Porter, D. C. (2009). *Basic Econometrics*, McGraw-Hill, Fifth Edition, Boston.

Hillygus, S. D. (2005). "The Missing Link: Exploring the Relationship Between Higher Education and Political Engagement", Political Behavior, 27(1): 25–47.

Keefer, P. and Khemani, S. (2004), "Democracy, Public Expenditure, and the Poor: Understanding Political Incentives for Providing Public Services", *World Bank Research Observer*, 20(1): 1–27.

Kıroğlu, K., Elma, C., Kesten, A. and Egüz, Ş. (2012). "Üniversitede Demokratik Bir Değer Olarak Hoşgörü", Sosyal Bilgiler Eğitimi Araştırmaları Dergisi, 3(2): 86–104.

Knutsen, H. C. and Dahlum, S. (2015). "Do Democracies Provide Better Education? Revisiting the Democracy–Human Capital Link", (http://folk.uio.no/carlhk/publications/Democracy%20and%20education%20quality.pdf).

Lipset, S. M. (1959). "Some Social Requisites of Democracy: Economic Development and Political Legitimacy", American Political Science Review, 53(1): 69–105.

Lütkepohl, H. (2005). *New Introduction to Multiple Time Series Analysis*, Springer-Verlag, Berlin.

Lutkepohl, H. and Kratzig, M. (2004). *Applied Time Series Econometrics (Themes in Modern Econometrics)*, Cambridge University Press.

Lutz, W., Cuaresma, C. J. and Shavazi, A. J. M. (2010). "Demography, Education, and Democracy: Global Trends and the Case of Iran", Population and Development Review, 36(2): 253–281.

MacKinnon, J. G. (1991). Critical Values for Cointegration Tests, in R, F, Engle and C, W, J, Granger (eds), Long-Run Economic Relationships: Readings in Cointegration. Oxford: Oxford University Press.

Morales, A. M., Fortes, A. I., and Rueda, G. A. (2013). "Institutions and Public Expenditure on Education in OECD Countries", Review of Public Economics, 204(1): 67–84.

Mulligan, C. B., Gil, R., and Sala-i- Martin, X. (2004). "Do Democracies Have Different Public Policies than Nondemocracies?", Journal of Economic Perspectives, 18(1): 51–74.

Phillips, P. C. and Perron, P. (1988). "Testing for a Unit Root in Time Series Regression", Biometrika, 75(2): 335–346.

Sanborn, H. and Thyne, L. C. (2014), "Learning Democracy: Education and the Fall of Authoritarian Regimes", British Journal of Political Science, 44(4): 773–797.

Smith, C. (2015). "Econometric Papers on the Relationship between Education, Democracy and Macroeconomic Crisis", Doctoral Thesis, UCL (University College London, (http://discovery.ucl.ac.uk/id/eprint/1468781).

Stiglitz, E. J. (1973). "Education and Inequality", The Annals of the American Academy of Political and Social Science, 409: 135–145.

Willinsky, J. (2002). "Education and Democracy: The Missing Link may be Ours", Harvard Educational Review, 72(3): 367–392.