A Multiple Regression Model on The Relationship Between Deliberative Democracy and Political Equity: The Cases of Hellenic Republic and Republic of Türkiye

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ABSTRACT

This article presents a multiple regression model in which the effect of the political equality index on the quality of deliberative democracy in Hellenic Republic and Republic of Türkiye is investigated. The data was drawn from the V-Dem (Varieties of Democracy) database which was announced in March 2024. As far as Hellenic Republic is concerned, the final conclusions of the research include the positive effect of increasing the participation of women and LGBTI people on the index of deliberative democracy. Also, an interesting finding is the fact of the absence of importance of the participation of individuals in primary and secondary education in deliberative democracy, a fact that may be linked to the discredit of the Greek school. As far as Republic of Türkiye in concerned, there is a negative relationship between the participation of citizens in tertiary education, as well as a negative relationship between the distribution of power by sexual orientation and deliberative democracy index. Finally, the participation of citizens in primary education has a positive coefficient and is highly statistically significant.

Keywords: Deliberative Democracy, Political Equality, Hellenic Republic, Republic of Türkiye.

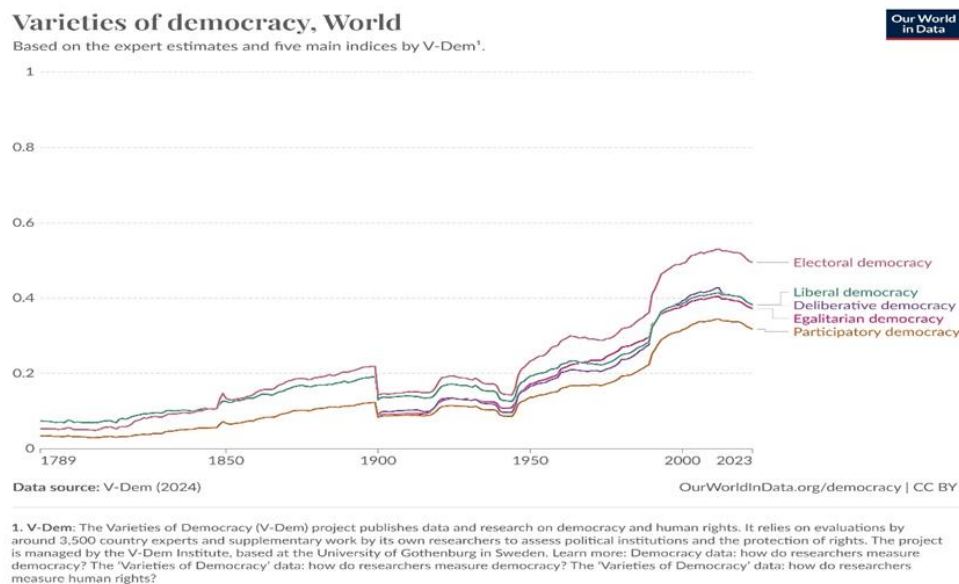## INTRODUCTION: The Concept of Deliberative Democracy

The principle of deliberative democracy focuses on the process by which decisions are made in a state. A deliberative process is one in which public thought is centered on the common good and mobilizes political decisions without considering emotional appeals, local interests, or coercion (Paionidis 1998). According to this principle, democracy requires more than a mere cumulative correspondence of existing preferences. Additionally, there must be respect for dialogue at all levels-from the formation of preferences to the final decision-among informed and competent participants who are open to persuasion.

Deliberative democracy refers to a type of democracy where decision-making occurs through deliberations and discussions among citizens. In this model, public discussion and dialogue play a central role in shaping political decisions. The goal is to encourage broad citizen

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participation in policy creation and to ensure that decisions are made based on information and consultation, respecting diverse views and interests (Parousis 2005). The graph below shows the deliberative democracy index in relation with the other indices of the V-Dem database.

Varieties of democracy, World
Based on the expert estimates and five main indices by V-Dem'.

Data source: V-Dem (2024)   OurWorldInData.org/democracy | CC BY

1. **V-Dem**: The Varieties of Democracy (V-Dem) project publishes data and research on democracy and human rights. It relies on evaluations by around 3,500 country experts and supplementary work by its own researchers to assess political institutions and the protection of rights. The project is managed by the V-Dem Institute, based at the University of Gothenburg in Sweden. Learn more: Democracy data: how do researchers measure democracy? The 'Varieties of Democracy' data: how do researchers measure democracy? The 'Varieties of Democracy' data: how do researchers measure human rights?

Deliberative democracy can function through various mechanisms, such as public meetings, forums, working groups, online platforms, etc. In this context, the government often considers the views and proposals of citizens before making final decisions (URL-1). Public consultation, often referred to as public comment or simply consultation, is a structured process that seeks input from the public on various issues affecting the community. Deliberative democracy aims to enhance the open and transparent decision-making process, increase citizens' trust in governments, and create more representative and fair policies.

This input can be collected through various forms:

- Public Meetings: These are open sessions, such as town assemblies, where community members can express their views and concerns directly to decision-makers and involved stakeholders.

- Written Forms: These may include public comments or surveys, where individuals can submit their opinions in writing.

- Consultation Groups: These may include groups such as citizens' assemblies or citizens' committees, which can be conducted with selected individuals or statistically representative samples of the population, allowing for the determination of majority opinion (Paionidis 1998).

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The main goals of public consultation are to improve public participation and influence, as well as the transparency and efficiency of government projects, laws, or regulations. Public consultation typically involves the publicizing of the issue under consultation, the bidirectional flow of information and exchange of views, and the involvement of stakeholders in drafting policy or legislation (Schmidt 2000). There are various methods of consultation, but all include providing information about the issue under consideration and the opportunity for consultation on the regulation, law, or plan under review. While public consultations were historically conducted by governments, they are increasingly being carried out by non-governmental organizations, such as university programs and non-profit organizations.

V-Dem Database

The Varieties of Democracy (V-Dem) database is an extensive resource offering detailed information on various aspects of democracy across different countries and time periods. V-Dem evaluates democracy through multiple dimensions, capturing facets like electoral democracy, liberal democracy, participatory democracy, deliberative democracy, and egalitarian democracy. This multifaceted approach allows for a nuanced analysis of democratic practices. The database includes over 450 indicators, providing in-depth data on specific democratic aspects. These indicators cover a wide range of topics, such as civil liberties, political participation, the rule of law, and government functionality. It offers historical data, enabling researchers to examine changes in democratic practices over time, spanning from 1789 to the present, thus providing a long-term perspective on democratic evolution. A significant feature of this database is its global coverage, including data from nearly every country, making it a valuable resource for comparative political analysis. V-Dem gathers data through expert assessments, using a global network of over 3,000 country experts who provide detailed evaluations of democratic practices in their respective countries, enhancing the accuracy and reliability of the data.

Regarding methodology, V-Dem employs advanced statistical techniques to ensure data validity and reliability, including the use of Bayesian item response theory models to aggregate expert ratings and address measurement errors and biases. V-Dem offers disaggregated data at multiple levels, such as individual indicators, component indices, and composite indices, allowing users to explore specific aspects of democracy or aggregate data for broader analyses. The database also includes contextual variables that provide additional background information

on countries, such as GDP, population size, and other socio-economic indicators, helping to understand the broader context in which democratic processes occur. V-Dem uses inter-coder reliability checks and rigorous methodological frameworks to ensure the consistency and accuracy of the data collected from expert surveys, thus enhancing the credibility of the findings derived from the database.

V-Dem fosters a collaborative research community by providing tools and support for users, including data visualization tools, workshops, and conferences. This encourages the exchange of ideas and the advancement of democratic research. These characteristics make the V-Dem database a powerful tool for understanding the complexities of democracy and for conducting sophisticated comparative analyses across countries and historical periods.

The equation used to create the deliberative democracy index (v2x_delibdem) is as follows:

$$v2x\_delibdem =$$
$$.25 * v2x\_polyarchy^{1.585} + .25 * v2xdl\_delib + .5 * v2x\_polyarchy^{1.585} * v2xdl\_delib$$

In order to become a measure not only of the beginning of consultation but also of democracy, the index also considers the level of electoral democracy (v2x_polyarchy) (Coppedge et al. 2015).

Political Equality

This section concerns political equality, which refers to the extent to which members of a polity have equal political power. It does not refer to the inevitable differentiation in power that appears in all large societies between those who hold positions of power within the state (political elites) and the citizens. Rather, it pertains to the distribution of political power among social groups within the population.

But what does it mean for a group of individuals to exercise real political power? Although political power cannot be directly observed, one can infer that groups have power to the extent that they:

(a) actively participate in politics (through voting, etc.),

(b) participate in civil society organizations,

(c) have representation in government,

(d) are able to set the political agenda,

(e) influence political decisions, and

(f) influence the implementation of those decisions.

Individual Indicators of Political Equality

1. Distribution of Power by Socioeconomic Status Index (v2pepwrses)

All societies are characterized by some degree of economic inequality (wealth and income). In some societies, income and wealth are distributed in a glaringly unequal manner. In others, the gap between rich and poor is not as large. Here, we are not concerned with the degree of social inequality but rather with the political implications of this inequality. More specifically, we are interested in the extent to which wealth and income translate into political power. Responses ranged from the absolute dominance of wealthy individuals, who have a kind of monopoly on political power, to the equal distribution of political power among different social groups (Pemstein et al. 2023).

2. Distribution of Power by Social Group Index (v2pepwrsoc)

A social group is differentiated within a country based on cultural characteristics, ethnic and linguistic differences, religion, etc. (excluding differences based on sexual orientation and socioeconomic status). Social identity is contextually defined and may vary across countries and over time. Social identities are also likely to intersect, and thus an individual may be defined in multiple ways, e.g., as part of multiple groups. The questions ranged from the absolute monopoly of political power by one social group, which includes a minority of the population and does not frequently change, to the equal distribution of political power across all social groups without particular emphasis on the characteristics that differentiate them from others (Pemstein et al. 2023).

3. Distribution of Power by Gender Index (v2pepwrgen)

This index is similar to the previous one but considers only gender for the potential differentiation of political power. The questions ranged from the absolute monopoly of political power by men to the equal distribution of power between men and women (Pemstein et al. 2023).

4. Distribution of Power by Sexual Orientation Index (v2pepwrort)

The index differentiates the political power of heterosexuals, lesbians, gays, bisexuals, and transgender individuals (LGBTQ+) as members of the political system who do not disclose their sexuality from the political power of lesbians, gays, bisexuals, and transgender individuals (LGBTQ+) who do disclose it. The first category will be referred to as "heterosexuals" and the second as "LGBTQ+." It should be noted that when comparing the political power of these two groups, we refer to their power relative to the overall population. In other words, when we say that the LGBTQ+ community has less, equal, or more power than heterosexuals, we mean in relation to their share of the general population. Responses ranged from the absolute exclusion of LGBTQ+ individuals from the public sphere, thus deprived of substantive political power, to the greater political power of this group due to wealth or greater mobilization and organization (Pemstein et al. 2023).

5. Educational Equality Index (v2peedueq)

The question concerns the extent of high-quality basic education capable of providing the tools for exercising the basic rights of adult citizens. Basic education refers to ages 6 to 16, although this range may vary in some countries. The questions ranged from the assumption of low-quality basic education with at least 75% of students receiving it, which undermines their future as citizens, to the assumption that education provided is equal for all with less than 5% receiving low-quality education (Pemstein et al. 2023).

6. Health Equality Index (v2pehealth)

The question concerns the provision of high-quality healthcare guaranteed for all. Low-quality healthcare can affect the basic rights of citizens, as the lack of care can prevent them from fulfilling their duties, participating in social and political organizations, or in voting. The questions ranged from the assumption of low-level healthcare with 75% of citizens being politically inactive due to poor health conditions to the view that there is equal treatment of all citizens (Pemstein et al. 2023).

7. Participation of citizens in education

The following three indices concern the participation of citizens in primary (v2peprisch), secondary (v2pesecsch), and tertiary education (v2petersch). The data were drawn from the Barro and Lee databases (2016).

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Aim and Methodology of the Research

Republic of Türkiye and Hellenic Republic are two neighboring countries with a long history and fluctuating relations. Nevertheless, they share many common characteristics due to the interaction and the exchange of cultures. It would be interesting to investigate the impact of the political equity index to the level of deliberative democracy and to compare the results between the two countries, so as to shed some light on both the different and the similar characteristics of the two societies. So, econometric methods were used to investigate the impact of the political equality index on the quality of the deliberative dimension of democracy in Hellenic Republic and Republic of Türkiye. Specifically, a time series analysis was conducted using a multiple regression model after performing the necessary reliability checks with the help of the EViews software.

A multiple regression model is a statistical tool used to understand the relationship between one dependent variable (outcome) and two or more independent variables (predictors). This model extends simple linear regression, which only involves one predictor, by incorporating additional predictors to provide a more comprehensive analysis. The general form of a multiple regression equation is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \epsilon$$

- β_0: Intercept (the expected value of Y when all Xs are zero).
- $\beta_1, \beta_2, ..., \beta_n$: Regression coefficients that measure the change in the dependent variable for a one-unit change in each predictor, holding other variables constant.
- ϵ: Error term, capturing the variability in Y that cannot be explained by the predictors.

The purpose of a multiple regression model is as follows:

- Prediction: To forecast values of the dependent variable based on known values of the independent variables.
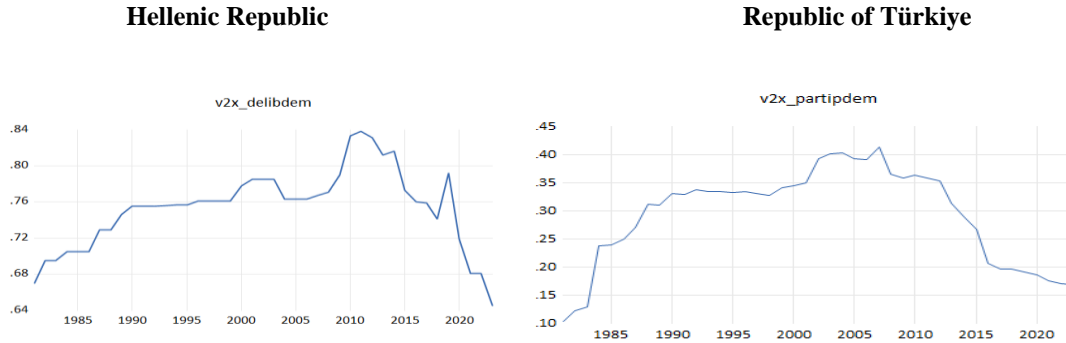
- Explanation: To understand the strength and type of relationships between the dependent variable and each predictor.

Descriptive Statistics

The following graphs presents the trajectory of the deliberative democracy index in Hellenic Republic and Republic of Türkiye from 1981 to 2023. We observe that starting from the period
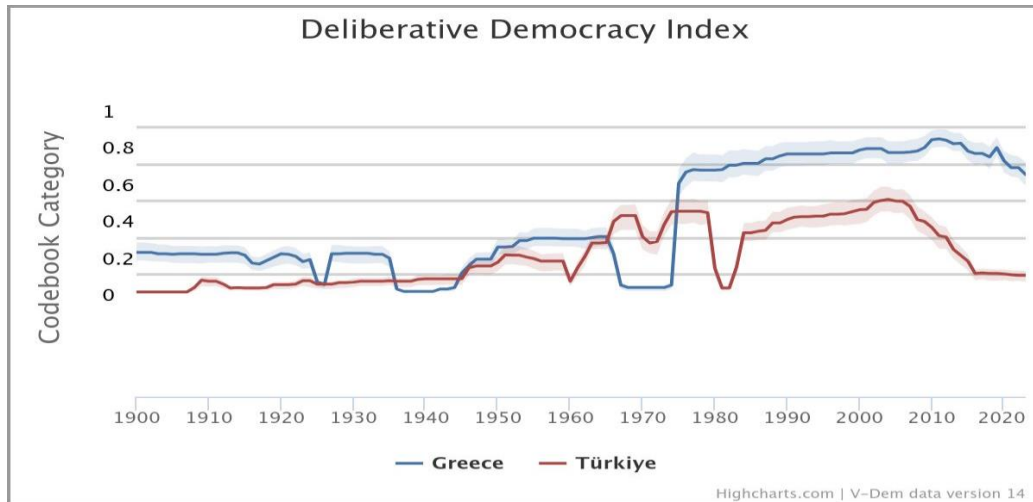

when the economic crisis became known, there is a sharp decline in the level of deliberative democracy in both countries, reaching a peak in the current period.

Graph: 1. The deliberative democracy index in Hellenic Republic and in Republic of Türkiye

Hellenic Republic   **Republic of Türkiye**

In case of Republic of Türkiye the minimum value is 0.03 and the maximum 0.51, whereas the mean is 0.3149. In Hellenic Republic the minimum value is 0.65 and the maximum 0.84, whereas the mean is 0.7532. Below we can observe the deliberative democracy index in both countries from 1900 to 2020.

Graph: 2. The deliberative democracy index in Hellenic Republic and in Republic of Türkiye from 1900 to 2020

Below we present the indices that form the political equality index. The first country examined is Hellenic Republic. Based on our analysis, the following trends are observed in the political equality indicators:

- General Upward Trend: Most indicators show a positive trend, indicating an improvement in political equality across various domains.
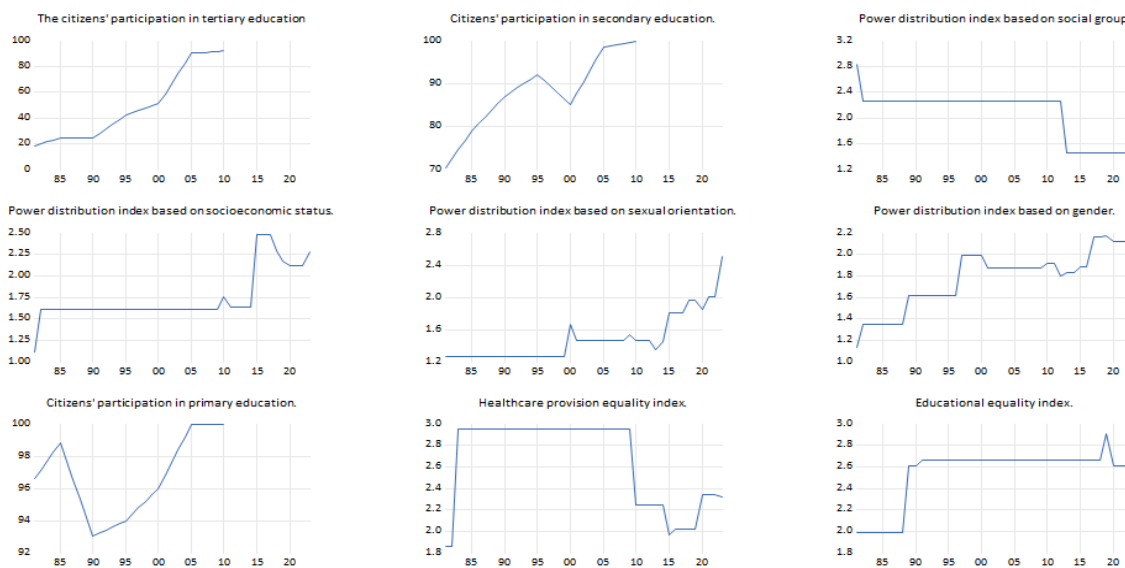
- Healthcare Provision Index: This specific index experienced a significant drop during the economic crisis in 2011. This decline can be attributed to fiscal cuts and the challenges faced by the healthcare system during that period.

- Power Distribution Index Based on Social Group: Similar to the healthcare provision index, this index showed a marked decline in 2011. This trend is likely linked to increased social and economic inequality during the crisis period.

- Participation in Education: The indicators for participation in all three levels of education showed a significant increase. This positive development may be due to political and social initiatives that encouraged access to education for everyone.

- Power Distribution Based on Sexual Orientation and Gender: These indices showed a sharp increase, indicating a significant social transformation in Greek society. This increase can be attributed to legislative and social changes promoting equality and acceptance of diversity.

Overall, these observations suggest that, despite the challenges arising from the economic crisis, Greek society has made significant strides towards political equality, especially in terms of education and minority rights. The graph below shows the deliberative democracy in these two countries comparatively

Graph: 3. Individual Indicators of the Political Equality Index in Hellenic Republic
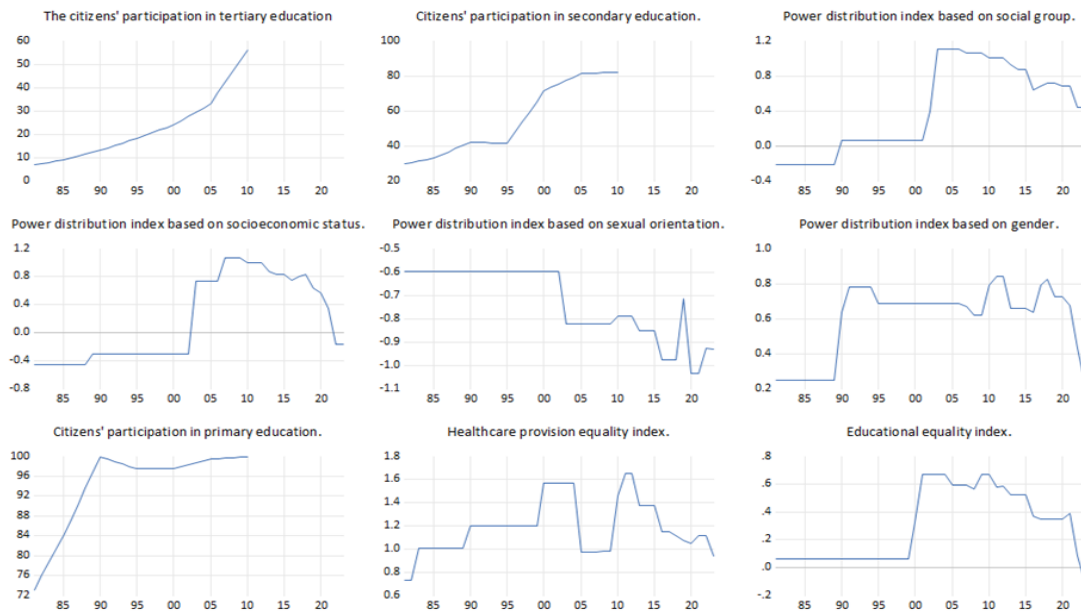
As far as Republic of Türkiye is concerned:

- The citizens' participation in tertiary education shows a steady increase, with a sharp rise post-2005. This suggests a significant improvement in access to higher education, likely due to educational reforms or increased investment in tertiary education.

- As far as the citizens' participation in secondary education is concerned we observe a sharp increase around 1995, then it stabilizes. This indicates a successful push towards universal secondary education around the mid-90s, maintaining high levels thereafter.

- The power distribution index by social group shows a significant rise around 1995, followed by fluctuations. This reflects an initial improvement in social group equality, but subsequent fluctuations suggest ongoing challenges in maintaining this equality.

- The power distribution index by socioeconomic status shows a sharp increase around 1995, and a decline after 2015. This indicates an increased socioeconomic equality in the mid-90s, but a recent decline suggests rising disparities or challenges in sustaining equality.

- Interestingly the power distribution index by sexual orientation is variable, with significant dips around 2005. This fact reflects inconsistent progress in power distribution equality for different sexual orientations, with notable setbacks and recoveries.

- More or less the same applies to power distribution index by gender. It increases around 1995, then it fluctuates, and it declines around 2020. This fact shows initial improvements in gender equality, but recent declines highlight persistent gender power disparities.

- The citizens' participation in primary education shows a high participation, and a slight decline post-2005. This indicates near-universal primary education, with minor recent declines possibly due to socioeconomic or policy changes.

- Then, healthcare provision equality index is presented with an increase around 1995, then it stabilizes, and finally declines around 2020. This fact reflects initial improvements in healthcare equality, but recent declines suggest emerging disparities in healthcare access.

- Finally, the educational equality index shoes a sharp increase around 1995, and a decline post-2005. This depicts the significant initial strides in educational equality, with later declines pointing to challenges in sustaining these gains.

Graph: 4. Individual Indicators of the Political Equality Index in Republic of Türkiye

Generally speaking, 1995 is a turning point in Republic of Türkiye. Many indices show significant changes around 1995, suggesting major reforms or socio-political changes during this period. Also, several indices indicate declines or fluctuations post-2015/2020, which may point to emerging challenges in maintaining equality and access across various dimensions. These trends highlight the complexities of achieving and maintaining equality and participation in education and power distribution across different societal dimensions.

Multiple regression model

Before proceeding with the regression analysis, we need to perform the necessary checks to ensure the reliability and validity of our model. First, the case of Hellenic Republic will be presented followed by the case of Republic of Türkiye.

Hellenic Republic

Unit root tests

First in this study, unit root tests will be conducted to investigate whether the time series is stationary or not.

Null Hypothesis (H_0): The time series has a unit root, indicating that it is non-stationary.

Alternative hypothesis (H_1): The time series does not have a unit root, indicating that it is stationary.

Stationarity in a time series refers to the property that the statistical characteristics of the data series remain constant over time. A stationary time series is one in which the mean, variance, and autocorrelation remain constant over time. In our study the dataset includes observations for the time period from 1990 to 2023 for these ten variables; a total of 358 observations were obtained. In our case, all three indicators (Im, Pesaran and Shin W-stat, ADF – Fisher Chi-square, PP – Fisher Chi-square) are below 0.05, indicating that the time series is stationary (I- 1).

Table: 1. Unit root tests

Group unit root test: Summary
Series: V2X_DELIBDEM, V2PETERSCH, V2PESECSCH, V2PEPWRSOC,
    V2PEPWRSES, V2PEPWRORT, V2PEPWRGEN, V2PEPRISCH,
    V2PEHEALTH, V2PEEDUEQ
Date: 05/14/24   Time: 14:06
Sample: 1981 2023
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 8
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.46787	0.0000	10	358
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-11.2635	0.0000	10	358
ADF - Fisher Chi-square	174.541	0.0000	10	358
PP - Fisher Chi-square	209.316	0.0000	10	371

** Probabilities for Fisher tests are computed using an asymptotic Chi
    -square distribution. All other tests assume asymptotic normality.

Then the autocorrelation test, heteroscedasticity test and multicollinearity test will be performed.

Autocorrelation test

The autocorrelation test allows us to assess the relationship between observations in a time series at different time intervals (lags). This can give us clues as to whether the time series shows repeating patterns at specific time intervals.

H0: There is no first-order autocorrelation.

H1: There is a first-order autocorrelation.

Table: 2. Autocorrelation Test

```
Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic        0.317576    Prob. F(2,18)            0.7319
Obs*R-squared      1.022507    Prob. Chi-Square(2)      0.5997
```

Thus, because the p-value is greater than 0.05, the data are not correlated.

Heteroscedasticity test

As we can see in the next table, the Breusch-Pagan-Godfrey heteroscedasticity test is statistically significant (0.2148). Therefore, homoscedasticity is observed in our model. Homoscedasticity is an important assumption in statistics and econometrics, especially when using parameter estimation models. The presence of homoscedasticity facilitates the evaluation and interpretation of model results. In contrast, heteroscedasticity (variable dispersion at different points) can affect the statistical unreliability of estimators and statistical tests, so it is important to consider it in data analysis.

Table: 3. Heteroscedasticity Test

```
Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic          1.461550    Prob. F(6,42)            0.2148
Obs*R-squared        8.463693    Prob. Chi-Square(6)      0.2061
Scaled explained SS  35.02056    Prob. Chi-Square(6)      0.0000
```

Multicollinearity Test

Multicollinearity refers to the situation where there is a high correlation between the independent variables of a regression model. This means that the independent variables are relatively closely related to each other, making it difficult to separate the effect of each variable in explaining the dependent variable.

In our case, the Variance Factor (VIF) was used to test for multicollinearity. To examine multicollinearity, we need to report the Center VIF column. There was variation in the results, and all variables did not have scores below 10. It is worth noting that a threshold of 10 indicates multicollinearity. It was therefore decided to remove the three problematic variables from the model, which were the index of participation in higher education, the index of distribution of power due to social group and the index of educational equality.

```
Variance Inflation Factors
Date: 05/14/24   Time: 14:58
Sample: 1981 2023
Included observations: 30
```

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
V2PESECSCH	1.89E-07	348.9549	2.881379
V2PEPWRSES	0.000759	458.5909	1.556246
V2PEPWRORT	0.000941	402.0542	2.940274
V2PEPWRGEN	0.000236	158.7089	3.411013
V2PEPRISCH	1.47E-06	3237.560	1.927087
V2PEHEALTH	7.33E-05	142.2290	1.495582
C	0.010459	2460.764	NA

After all the reliability checks were done and we arrived at the final model, we proceeded to the regression analysis process with the deliberative democracy index as the dependent variable and the indicators of participation in secondary education, participation in primary education, equality in health care, distribution of power based on gender, distribution of power based on sexual orientation and distribution of power due to socio-economic status.

Before interpreting them, it is worth noting that the adjusted R-squared value indicates that 89% of the variation in the deliberative democracy index is explained by the above indices. The F-statistic is 40.9 indicating statistical significance, which indicates that our model is well-fitted. Finally, the Durbin-Watson statistic is 1.4, indicating no serial correlation in our model.

```
Dependent Variable: V2X_DELIBDEM
Method: Least Squares
Date: 05/16/24   Time: 12:15
Sample (adjusted): 1981 2010
Included observations: 30 after adjustments
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
V2PESECSCH	0.002136	0.000435	4.910349	0.0001
V2PEPWRSES	0.089625	0.027557	3.252343	0.0035
V2PEPWRORT	0.091273	0.030669	2.976087	0.0068
V2PEPWRGEN	0.039165	0.015348	2.551731	0.0178
V2PEPRISCH	-0.004507	0.001213	-3.716279	0.0011
V2PEHEALTH	-0.020962	0.008564	-2.447592	0.0224
C	0.727236	0.102270	7.110934	0.0000

R-squared	0.914359	Mean dependent var	0.751367
Adjusted R-squared	0.892018	S.D. dependent var	0.034364
S.E. of regression	0.011292	Akaike info criterion	-5.928465
Sum squared resid	0.002933	Schwarz criterion	-5.601519
Log likelihood	95.92697	Hannan-Quinn criter.	-5.823872
F-statistic	40.92735	Durbin-Watson stat	1.431758
Prob(F-statistic)	0.000000		

All regression coefficients participating in the model were statistically significant. The conclusions that can be drawn are the following:

• An increase in the index of distribution of power due to socio-economic status increases the index of deliberative democracy. So, the more equal the distribution of political power between the various social groups, the higher the index of consultation in society.

• Also, the increase in the participation of people with a different sexual orientation from the normal one seems to positively affect the index of deliberative democracy, which demonstrates the need for equal participation of all people regardless of specific gender identity.

• The same is true in relation to the gender-based power distribution index. The equal participation of both men and women has a positive effect on the quality of deliberative democracy in Hellenic Republic.

• The effect of the participation index in primary and secondary education on this indicator is low, which can have multiple interpretations.

Republic of Türkiye

The same methodology will be followed for Republic of Türkiye. First, unit root tests will be applied.

```
Group unit root test: Summary
Series: V2X_DELIBDEM, V2PETERSCH, V2PESECSCH, V2PEPWRSOC,
    V2PEPWRSES, V2PEPWRORT, V2PEPWRGEN, V2PEPRISCH,
    V2PEHEALTH, V2PEEDUEQ
Date: 05/22/24   Time: 11:33
Sample: 1981 2023
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 5
Newey-West automatic bandwidth selection and Bartlett kernel
```

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.66985	0.0001	10	358
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.79749	0.0000	10	358
ADF - Fisher Chi-square	112.674	0.0000	10	358
PP - Fisher Chi-square	132.120	0.0000	10	371

** Probabilities for Fisher tests are computed using an asymptotic Chi
    -square distribution. All other tests assume asymptotic normality.

A total of 358 observations were obtained. As far as Republic of Türkiye is concerned, all three indicators (Im, Pesaran and Shin W-stat, ADF – Fisher Chi-square, PP – Fisher Chi square) are below 0.05, indicating that the time series is stationary (I- 1).

Autocorrelation test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 1 lag

F-statistic	4.172975	Prob. F(1,19)	0.0552
Obs*R-squared	5.402381	Prob. Chi-Square(1)	0.0201

Due to the fact that p value is greater than 0,05 the data are not correlated.

Heteroskedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	1.151353	Prob. F(9,20)	0.3751
Obs*R-squared	10.23857	Prob. Chi-Square(9)	0.3315
Scaled explained SS	9.524824	Prob. Chi-Square(9)	0.3903

P value is greater than 0.05 (0.3751). So, homoskedasticity is observed in our data.

Multicollinearity Test

The multicollinearity test showed that some variables scored higher than 10. So, we decided to remove them from our model as far as Republic of Türkiye is concerned. These variables were the distribution of power by social group index, the distribution of power by socioeconomic status index and the participation of citizens in secondary education. The following table shows the results of the above test after the removal.

Variance Inflation Factors
Date: 05/22/24   Time: 11:57
Sample: 1981 2023
Included observations: 30

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
V2PETERSCH	3.22E-06	26.36915	7.003321
V2PEPWRORT	0.047431	254.9207	5.633458
V2PEPWRGEN	0.006785	30.14528	3.699615
V2PEPRISCH	4.97E-06	544.4329	3.659966
V2PEHEALTH	0.004987	84.43674	3.285769
V2PEEDUEQ	0.008442	14.59027	7.595036
C	0.044396	541.5570	NA

After all the reliability checks were done and we arrived at the final model, we proceeded to the regression analysis process with the deliberative democracy index as the dependent variable and the indicators of participation in tertiary education, participation in

primary education, equality in health care, distribution of power based on gender, distribution of power based on sexual orientation and the educational equality index.

```
Dependent Variable: V2X_DELIBDEM
Method: Least Squares
Date: 05/22/24   Time: 12:23
Sample (adjusted): 1981 2010
Included observations: 30 after adjustments
Huber-White (HC0) heteroskedasticity consistent standard errors and
    covariance
No d.f. adjustment for standard errors & covariance
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
V2PETERSCH	-0.003966	0.001576	-2.516498	0.0193
V2PEPWRORT	-0.261324	0.102388	-2.552279	0.0178
V2PEPWRGEN	-0.079924	0.070404	-1.135225	0.2680
V2PEPRISCH	0.015733	0.002427	6.481995	0.0000
V2PEHEALTH	0.085257	0.057773	1.475722	0.1536
V2PEEDUEQ	0.078342	0.065832	1.190028	0.2462
C	-1.259554	0.200841	-6.271388	0.0000

R-squared	0.867391	Mean dependent var		0.383467
Adjusted R-squared	0.832797	S.D. dependent var		0.121280
S.E. of regression	0.049592	Akaike info criterion		-2.969022
Sum squared resid	0.056565	Schwarz criterion		-2.642076
Log likelihood	51.53532	Hannan-Quinn criter.		-2.864429
F-statistic	25.07371	Durbin-Watson stat		0.859265
Prob(F-statistic)	0.000000	Wald F-statistic		24.88297
Prob(Wald F-statistic)	0.000000			

In the case of Republic of Türkiye three coefficients were statistically significant. More specifically:

- the value of participation of citizens in tertiary education increases by one unit, the dependent variable decreases by approximately 0.003966 units. The t-value indicates that this coefficient is statistically significant at the 0.05 level, suggesting that the relationship between this index and the dependent variable is unlikely to be due to random chance.

- Similar to the previous variable, the distribution of power by sexual orientation index also has a negative coefficient, indicating that an increase in its value is associated with a decrease in the dependent variable. The coefficient is statistically significant at the 0.05 level.

- The participation of citizens in primary education has a positive coefficient and is highly statistically significant ($p < 0.05$).

CONCLUSION

This research examined the impact of the political equality index on the deliberative democracy index in Hellenic Republic and Republic of Türkiye. The data was drawn from the V-Dem database as it was formed in March 2024. The main purpose of the research was to investigate the factors that co-shape the level and quality of consultation in Hellenic Republic and Republic of Türkiye. A multiple regression econometric model was applied using the EViews statistical package. There were some multicollinearity problems in relation to some individual indicators of the political equality index in both countries, which forced us to remove them from the specific model. The Varieties of Democracy (V-Dem) project is a well-respected and widely used database for measuring democracy. It provides detailed, nuanced data on democratic practices across the globe. However, as with any large-scale data project, it's important to consider potential biases that may influence the data and its interpretation. Potential sources of bias in V-Dem could be the large network of country experts to code data. These experts come from diverse backgrounds and might have their own perspectives and biases. Also, the interpretation of democratic principles and practices can vary significantly across different cultures and regions. What constitutes "democracy" or "freedom" in one context may not be viewed the same way in another, potentially leading to cultural bias in how variables are coded and interpreted. In addition, V-Dem data is updated regularly, but political contexts and democratic norms can change rapidly (Pemstein et al. 2018). This dynamic nature might lead to discrepancies or biases in data for countries undergoing rapid transformation. Last but not least, the design of V-Dem's indicators and their aggregation into composite indices might introduce bias. Decisions about which indicators to include, how to weight them, and how to aggregate them are inherently subjective and can reflect certain theoretical or normative preferences (Marquardt & Pemstein 2018. Wagner et al. 2020).

The final conclusions, as far as Hellenic Republic is concerned, include the positive contribution of the equal participation of all socio-economic groups, women in the public sphere as well as the LGBTI community. An interesting finding is the lack of importance of participation in secondary and primary education, a fact that may also be related to the discredit of the public education system due to the chronic pathologies that plague public education in Hellenic Republic.

The equal participation of women and LGBTI people in society has a direct and important relationship with the quality of democracy. The reasons this relationship is critical

include political representation and decision-making. When women and LGBTI people are actively involved in politics and decision-making, their needs and rights are considered. This leads to fairer and more equal policies that reflect the different aspects of society. The absence of these groups from the political scene can lead to laws and policies that ignore or even suppress their rights. In this way, social justice is strengthened and human rights are better protected. Democracy is based on the principles of equality and justice. The equal participation of women and LGBT people strengthen social justice and promotes human rights. Democratic societies that embody these principles are more resilient and peaceful. The above results in political stability and social cohesion. When all groups in society feel they have a voice and participation in decision-making, social cohesion is strengthened. This contributes to the reduction of social tensions and strengthens political stability. The impact of political stability is economic growth and prosperity. Research shows that the participation of women in economic life and the inclusion of LGBTI people in the labor market can enhance economic development. Democracies that promote gender and LGBT equality tend to be more productive and innovative. Finally, a consequence of prosperity is cultural and social progress. The equal participation of these groups enhances cultural and social diversity, which is fundamental to the cultural development and modernization of a society (Schmidt 2000). Recognizing and respecting diversity promotes a more open and tolerant society.

In relation to the finding of the discrediting of the public school in Hellenic Republic, it can be said that it is a multidimensional phenomenon with social, economic and political dimensions. The main reasons contributing to this phenomenon include underfunding and lack of resources. Public schools often face severe funding shortfalls, which affects the quality of education they provide. These deficiencies may concern logistical infrastructure, modern educational tools, and access to technology. The insufficient maintenance of school buildings and the lack of basic resources degrade the educational environment (URL-1). Teachers' salaries and professional development also play an important role. Low salaries and limited professional development of teachers affect the quality of teaching. Teachers are often not motivated to improve their skills or seek innovative teaching methods, which in turn negatively affects the quality of education provided to students. On another level, social inequalities are also an important factor in depreciation (Schmidt 2000). Public education often reflects and reinforces social inequalities. Students from lower socio-economic strata have fewer opportunities for extracurricular activities and additional support, while students from affluent

families can supplement their education with private lessons and tutoring. A long-standing pathology of the Greek education system is tutoring and private education. The spread of tutoring and private education in n Hellenic Republic is an indication of the public school's inability to respond to the demands of students and parents. Many families see childcare as necessary for their children's success in the Panhellenic exams, which downplays the importance of public school. Additionally, bureaucracy and severe administrative problems play their part in this distortion. Excessive bureaucracy and inefficient administration in public schools can hinder the implementation of improvement measures and delay the resolution of problems. This creates a dysfunctional environment where students and teachers cannot perform to their full potential. Finally, the factor of social perceptions and attitudes is also important. The public perception of the value of public schooling has also taken a hit. When society considers public schools to be inferior to private ones, this reinforces discredit and creates a vicious circle where the best students and teachers turn to private education (The Prevalence of the Tutoring and the Discrediting of the School in Greek Education 2020).

As far as Republic of Türkiye is concerned, the negative relationship between citizens' participation in tertiary education and deliberative democracy index can have various interpretations. This could mean that as more people enroll in tertiary education, the quality or extent of deliberative democracy decreases. Individuals in higher education might have less time and resources to participate in deliberative democratic processes, such as public discussions, town hall meetings, or community forums. Higher education might expose individuals to more critical perspectives on political systems, potentially leading to disenchantment with democratic processes and a lower engagement in deliberative practices. Increased tertiary education participation might create a more segmented society where educated individuals engage in different forms of political activity than those without higher education, potentially leading to a decrease in inclusive deliberative practices.

Also, the observation that the distribution of power by sexual orientation index has a negative coefficient, indicating that an increase in its value is associated with a decrease in the deliberative democracy index, suggests a negative relationship between the empowerment of sexual minorities and deliberative democratic practices. Efforts to redistribute power towards sexual minorities might lead to social tensions or backlash from groups opposed to these changes, potentially disrupting deliberative democratic processes. Increasing focus on issues related to sexual orientation might divert attention and resources from other aspects of deliberative democracy, such as broad-based civic engagement and inclusive public discourse.

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Existing political and social institutions might resist changes towards greater power distribution by sexual orientation, leading to a decrease in overall deliberative practices as these institutions become more rigid and less open to inclusive dialogue Ince (Yenilmez 2021). Increased visibility and empowerment of sexual minorities might contribute to societal polarization, reducing the willingness or ability of different groups to engage in constructive, deliberative dialogue.

Finally, the finding that the participation of citizens in primary education has a positive coefficient and is highly statistically significant suggests a strong and positive relationship between primary education enrollment and the level of deliberative democracy. This means that as more citizens participate in primary education, the level of deliberative democracy tends to increase. Some interpretations of the above could be that primary education often lays the groundwork for basic civic knowledge and skills, which are essential for participating in democratic processes and deliberative practices (Gün & Baskan 2014). Primary education is typically more universally accessible than higher levels of education, promoting inclusivity and a broader base of citizen participation in democratic discourse. Also, early educational experiences can shape attitudes towards civic responsibility and participation, fostering a culture of engagement and dialogue from a young age. Higher rates of primary education participation might strengthen community ties and social cohesion, which are conducive to effective deliberative democracy.

Further investigation would be needed to fully understand the dynamics at play and to explore whether these relationships in Republic of Türkiye are specific to the context studied or indicative of broader patterns in similar societies.

In conclusion, consultation is one of the foundations of democracy. Including the above findings in the discussion on improving the existing situation can make democracy in both Republic of Türkiye and Hellenic Republic stronger and more effective, a fact necessary in solving the problems of the complex international environment in which we live.

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