

An Analytical and Classification Study of Arab Countries According to Governance Indicators Using Hierarchical Cluster Analysis

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Abstract:

This study aimed to classify 22 Arab countries according to governance indicators for the year 2023. To achieve this objective, six key governance indicators published by the World Bank were used: Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law, and Voice and Accountability. The study also relied on Hierarchical Cluster Analysis and the R software.

The findings revealed that Arab countries can be classified into three main categories based on governance quality: leading countries in governance, promising countries, and countries with weak performance. The results also indicated that improving governance indicators in the Arab region requires deep and comprehensive reforms, particularly in the areas of transparency, rule of law, and citizen participation.

Keywords: Governance; Governance Indicators; Arab Countries; Hierarchical Cluster Analysis.

Jel Classification Codes : H83; O43; O53; C1.

Résumé:

Cette étude visait à classer 22 pays arabes en fonction des indicateurs de gouvernance pour l'année 2023. Pour atteindre cet objectif, six indicateurs clés de gouvernance publiés par la Banque mondiale ont été utilisés : le contrôle de la corruption, l'efficacité du gouvernement, la stabilité politique et l'absence de violence/terrorisme, la qualité de la réglementation, l'état de droit, ainsi que la voix et la redevabilité. L'étude s'est également appuyée sur la technique de l'analyse hiérarchique par regroupement (analyse en grappes) et sur le logiciel R.

Les résultats ont révélé qu'il est possible de classer les pays arabes en trois grandes catégories selon la qualité de leur gouvernance : les pays arabes leaders en matière de gouvernance, les pays prometteurs et les pays à faible performance. L'étude a également montré que l'amélioration des indicateurs de gouvernance dans la région arabe nécessite des réformes profondes et globales, notamment dans les domaines de la transparence, de l'état de droit et de la participation citoyenne.

Mots clés: Gouvernance, Indicateurs de gouvernance, Pays arabes, Analyse hiérarchique par regroupement.

Jel Classification Codes : H83; O43; O53; C1.

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I. Introduction:

In recent decades, the issue of governance has become one of the most prominent concerns for policymakers and researchers around the world, due to its vital role as a cornerstone for achieving sustainable economic and social development. Continuous improvement in the quality of public institutions, the rule of law, government effectiveness, and the fight against corruption are all fundamental factors that contribute to creating a favorable investment climate and strengthening trust between citizens and governments.

In light of the political and economic transformations experienced by Arab countries in recent decades, the need to adopt sound governance systems capable of addressing challenges and achieving stability and a balance between efficiency and accountability has become increasingly urgent. In this context, governance indicators have emerged as an important analytical tool for assessing the performance of countries, as they measure progress or setbacks across various dimensions of good governance.

To diagnose the state of governance in Arab countries, the use of modern statistical tools capable of classifying countries according to their governance performance has become essential. Among these tools, Hierarchical Cluster Analysis stands out for its ability to group similar countries based on shared characteristics. This step is crucial for understanding the disparities between Arab countries in terms of governance quality and for helping decision-makers guide reforms toward a more efficient and transparent institutional environment.

I.1. Research Problem:

In this context, and considering the importance of governance in achieving stability and development in the Arab world, this study aims to analyze and classify Arab countries according to international governance indicators using Hierarchical Cluster Analysis. The central research question is therefore formulated as follows:

What is the state of governance in Arab countries, and how can these countries be classified according to the World Bank's governance indicators?

I.2. Research Hypotheses:

To address this research problem, the study is based on the following hypothesis:

Governance plays a pivotal role in achieving comprehensive development in Arab countries. These countries can be classified into three or four homogeneous groups based on the World Bank's global governance indicators.

I.3. Research Objectives:

This study aims to analyze the state of governance in Arab countries and to classify them into relatively similar groups in terms of performance. This will be achieved using the six main governance indicators and Hierarchical Cluster Analysis, with the aid of the R statistical software.

I.4. Research Significance:

The significance of this study lies in its focus on a priority issue for developing countries in general and Arab countries in particular. Sound governance has a direct impact on improving institutional performance, enhancing transparency and accountability, and achieving political and economic stability, thereby contributing to the attainment of sustainable development goals.

II. The Conceptual Framework of Governance:

This theoretical section on governance will address its definition, indicators, and dimensions.

II.1. Definition of Governance:

Governance has been defined in various ways, among the most prominent of which is the definition provided by the United Nations, which describes governance as: the process of decision-making and the process by which decisions are implemented. (UNESCAP, 2009)

The World Bank defines governance as: the manner in which power is exercised in the management of a country's economic and social resources for development. (World Bank, 1991, p.15)

Meanwhile, the International Monetary Fund (IMF) views governance as a mode of operation that brings transparency to government performance and assesses how effectively it manages public resources, in addition to ensuring an enabling environment for the private sector to operate. (Tawfiq, 2005, p.25)

II.2. Good Governance Indicators:

The Worldwide Governance Indicators (WGI) developed by the World Bank are among the most comprehensive, credible, and accurate tools for measuring the quality of governance. These indicators cover political, economic, and institutional dimensions and include the following six key components. (Kaufmann, 2010, p.37)

II.2.1. Voice and Accountability:

This indicator measures the extent to which a country's citizens are able to participate in selecting their government. It also captures freedom of expression, freedom of association, and the independence of the media. It reflects political freedoms, democratic elections, and civil liberties.

II.2.2. Political Stability and Absence of Violence/Terrorism:

This indicator assesses the likelihood of political instability and/or politically motivated violence, including ethnic tensions, armed conflicts, social unrest, terrorist threats, internal strife, political fragmentation, constitutional changes, or military coups.

II.2.3. Government Effectiveness:

This indicator evaluates the quality of public services, the quality and independence of the civil service from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. It draws on four different sources that measure the quality of executive institutions, bureaucratic performance, transaction costs, government stability, and the quality of public health services.

II.2.4. Regulatory Quality:

This indicator measures the government's ability to formulate and implement sound policies and regulations that promote private sector development, economic growth, and overall development.

II.2.5. Rule of Law:

This indicator includes two main aspects: the neutrality of laws and the extent to which citizens abide by them. It reflects the principle that all individuals, including rulers, public officials, and citizens, are subject to the law. It assesses confidence in and adherence to the rules of society, especially the enforcement of contracts, protection of property rights, effectiveness of police and judiciary, and the likelihood of crime and violence.

II.2.6. Control of Corruption:

This indicator measures the extent to which public power is exercised for private gain. It captures perceptions of corruption ranging from petty and grand forms of corruption to the state being captured by elites and private interests, as well as the ability of political and economic elites to divert public resources for personal benefit.

II.3. Dimensions of Governance:

Governance can be analyzed through the following main dimensions: (Al-Louzi, 2000, p.71)

- ***Political Dimension:*** This dimension concerns the nature of political authority and the legitimacy of its representation. It reflects the proper relationship between the ruler and the ruled, fostering positive interaction, cooperation, and a shared commitment to serving the public interest. This is only achievable if the state fundamentally promotes effective democracy.
- ***Economic and Social Dimension:*** This dimension focuses on economic performance levels aimed at achieving economic development, combating

corruption, and enhancing transparency. It also contributes to reducing investment risks through continuous and transparent monitoring of economic information. The social aspect, in turn, is embodied in the pursuit of distributive justice, raising living standards, and eradicating poverty.

- **Administrative Dimension:** This dimension relates to the rational and equitable management of a society's financial and human resources through the application of decentralization. The rationalization of public administration and ensuring its sustainable operation with high efficiency and effectiveness depends on the quality of the administrative apparatus, legal frameworks, and governance systems in place.

III. Empirical Section of the Study: Analytical Overview and Cluster Classification of Governance Indicators in Arab Countries

III.1. Study Presentation:

III.1.1. Methodology:

The study's methodology is based on the use of Hierarchical Cluster Analysis to classify Arab countries according to the main governance indicators, employing the R statistical software.

III.1.2. Study Sample and Period:

The study covers the year 2023 and includes the entire set of 22 Arab countries, namely: Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen.

III.1.3. Data Sources:

The data used for the study variables were obtained from the Worldwide Governance Indicators (WGI) database published by the World Bank. (World Bank Group, 2025)

These indicators are among the most internationally recognized tools for assessing governance quality, covering over 200 countries and territories and spanning the period from 1996 to 2023.

For the purposes of analysis and classification in this empirical section, the 2023 data for all Arab countries with complete indicator values were extracted.

III.1.4. Study Variables:

This section of the study is based on the six main governance indicators provided by the World Bank, namely:

- Control of Corruption (CC);
- Government Effectiveness (GE);
- Political Stability and Absence of Violence/Terrorism (PS);
- Regulatory Quality (RQ);
- Rule of Law (RL);

- Voice and Accountability (VA).

III.2. Analytical Overview of the Main Governance Indicators in Arab Countries for the Year 2023:

Table (01) presents the data for Arab countries regarding the six main governance indicators for the year 2023. These indicators are among the most widely used tools for assessing the quality of governance across countries. Their values range from -2.5 (weak performance) to +2.5 (strong performance).

Table (01): Main Governance Indicators in Arab Countries - 2023

Country	Control of Corruption (CC)	Government Effectiveness (GE)	Political Stability and Absence of Violence /Terrorism (PS)	Regulatory Quality (RQ)	Rule of Law (RL)	Voice and Accountability (VA)
Algeria	-0,59	-0,67	-0,58	-0,95	-0,68	-0,98
Bahrain	0,18	0,70	-0,37	1,08	0,47	-1,38
Comoros	-0,99	-1,54	-0,23	-1,24	-1,34	-0,81
Djibouti	-0,78	-0,73	-0,52	-0,93	-1,13	-1,27
Egypt	-0,75	-0,24	-0,87	-0,67	-0,18	-1,38
Iraq	-1,32	-1,39	-2,41	-1,44	-1,69	-0,96
Jordan	0,09	0,39	-0,20	0,22	0,26	-0,77
Kuwait	0,21	0,01	0,41	0,32	0,34	-0,59
Lebanon	-1,23	-1,58	-1,52	-1,01	-1,17	-0,65
Libya	-1,53	-1,64	-2,17	-1,95	-1,77	-1,39
Mauritania	-0,82	-0,76	-0,50	-1,00	-0,64	-0,66
Morocco	-0,54	-0,04	-0,37	-0,06	-0,13	-0,49
Oman	0,22	0,27	0,59	0,43	0,61	-1,00
Palestine	-0,68	-1,21	-1,87	-0,28	-0,68	-1,12
Qatar	0,70	1,20	0,99	0,98	0,93	-0,97
Saudi Arabia	0,54	0,80	-0,21	0,52	0,41	-1,42
Somalia	-1,73	-1,98	-2,38	-1,88	-2,21	-1,66
Sudan	-1,50	-1,98	-2,47	-1,60	-1,67	-1,60
Syrian	-1,75	-1,79	-2,75	-1,81	-2,04	-1,85
Tunisia	-0,34	-0,30	-0,63	-0,62	-0,14	-0,21
United Arab Emirates	1,07	1,60	0,68	1,04	0,88	-1,09
Yemen	-1,65	-2,28	-2,56	-1,84	-1,84	-1,55

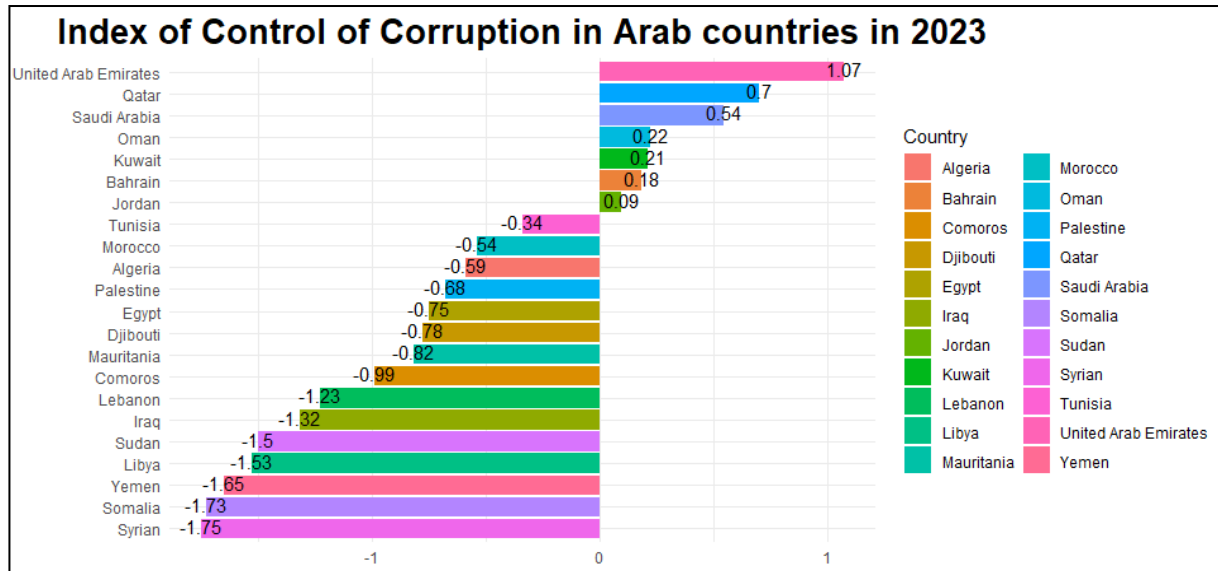
Source: Prepared by the author based on (World Bank Group, 2025)

The table reveals a significant disparity in the performance of Arab countries across the six governance indicators, highlighting the need for an in-depth analytical reading by ranking and classifying the countries according to each individual indicator.

III.2.1. Classification of Arab Countries According to the Control of Corruption Indicator:

Figure (01) presents the ranking of Arab countries based on the Control of Corruption indicator for the year 2023. It shows that Arab countries can be classified into two main categories based on the value of this indicator.

Figure (01): Ranking of Arab Countries by Control of Corruption – 2023



Source: Prepared by the author based on Table (01) and the R software.

The first group includes countries that recorded positive values, mainly the six member states of the Gulf Cooperation Council (GCC), in addition to Jordan. At the top of this group is the United Arab Emirates, followed by Qatar, indicating the success of these countries in promoting administrative integrity and combating corruption.

In contrast, the second group consists of the remaining Arab countries, which showed negative values on the corruption control indicator. Among these, Tunisia, Morocco, and Algeria recorded the highest relative scores within this group.

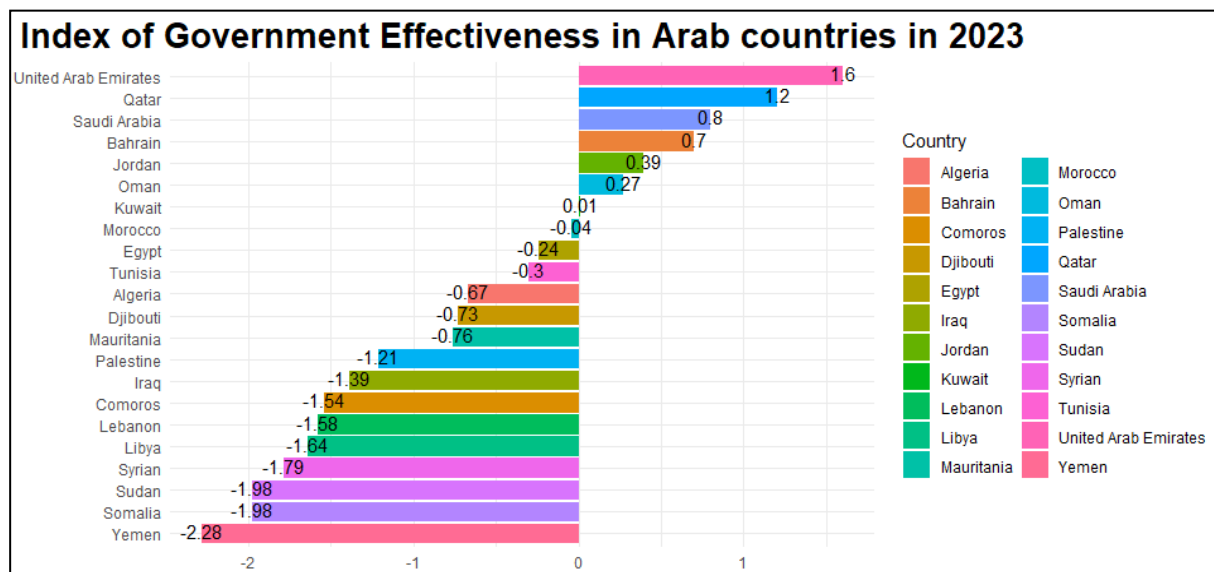
These classifications highlight the wide gap in anti-corruption efforts across Arab countries. Such analysis can serve as a valuable tool for understanding the administrative and economic performance of these countries, thereby supporting effective policymaking to promote sustainable development and attract investment.

III.2.2. Classification of Arab Countries According to the Government Effectiveness Indicator:

Figure (02) presents the ranking of Arab countries based on the Government Effectiveness indicator for the year 2023. Similar to the previous indicator

(Control of Corruption), the countries can be grouped into two main categories, each containing the same countries classified previously.

Figure (02): Ranking of Arab Countries by Government Effectiveness – 2023



Source: Prepared by the author based on Table (01) and the R software.

The first group includes Arab countries that achieved positive values on the government effectiveness scale. The United Arab Emirates and Qatar lead this group, reflecting their high performance in public service delivery and policy implementation.

The second group consists of countries that recorded negative values for this indicator. Morocco tops this group, while Yemen ranks at the bottom.

These results reveal a consistency in country classification between the Control of Corruption and Government Effectiveness indicators, suggesting a shared pattern in the performance of Arab governments in both areas. This alignment underscores the close link between combating corruption and enhancing governmental effectiveness in the Arab region.

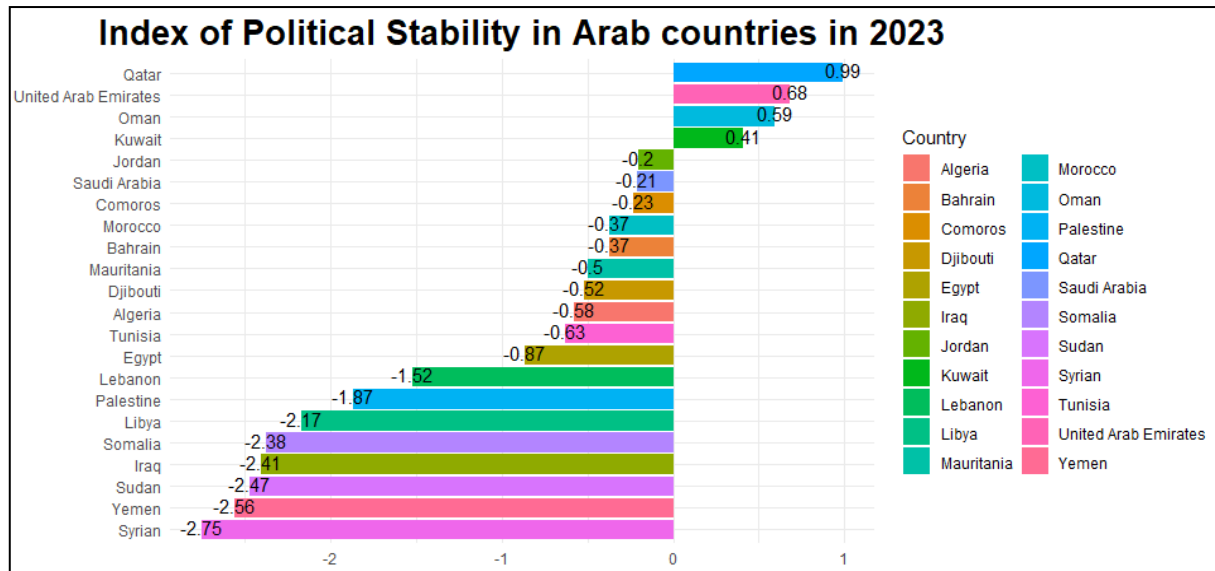
III.2.3. Classification of Arab Countries According to the Political Stability and Absence of Violence/Terrorism Indicator:

Figure (03) presents the ranking of Arab countries based on the Political Stability and Absence of Violence/Terrorism indicator for the year 2023. The results highlight two main categories that reflect the state of political stability and the prevalence of violence and terrorism in the Arab region.

The first group includes countries that recorded positive values, indicating relatively high levels of political stability and low levels of violence and terrorism. Only four Arab countries fall into this category: Qatar, the United Arab Emirates, Oman, and Kuwait. Qatar ranks first in this group, reflecting its strong

performance in ensuring political stability and minimizing threats of violence and terrorism.

Figure (03): Ranking of Arab Countries by Political Stability and Absence of Violence/Terrorism – 2023



Source: Prepared by the author based on Table (01) and the R software.

The second group includes 18 Arab countries that recorded negative values on this indicator. Syria ranks at the bottom due to the severe challenges it faces in terms of political instability and ongoing violence.

This classification underscores the significant gap between countries with relative stability and those facing major political and security challenges. It provides a clearer understanding of the state of stability across the Arab region.

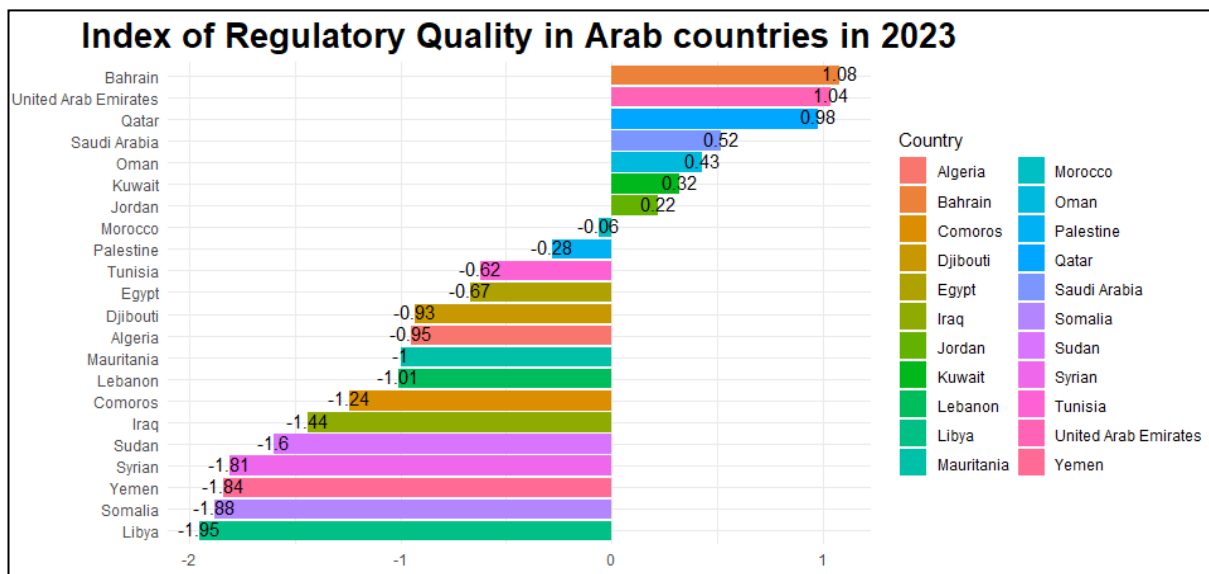
III.2.4. Classification of Arab Countries According to the Regulatory Quality Indicator:

Figure (04) presents the ranking of Arab countries based on the Regulatory Quality indicator for the year 2023. This indicator reflects the efficiency and effectiveness of governmental and administrative structures in managing public affairs and improving the business environment.

The analysis reveals two main groups, which align with the classifications previously established for the Control of Corruption and Government Effectiveness indicators.

The first group includes Arab countries with high regulatory quality, namely the six Gulf Cooperation Council (GCC) countries and Jordan, all of which recorded positive values on this indicator. These results indicate significant progress in structuring public administration and enhancing the quality of governance systems.

Figure (04): Ranking of Arab Countries by Regulatory Quality – 2023



Source: Prepared by the author based on Table (01) and the R software.

The second group comprises Arab countries with low regulatory quality, led by Morocco, while Libya ranks last in this group.

Regulatory quality plays a crucial role in facilitating the business environment and encouraging investment, ultimately contributing to stronger economic growth and greater stability. Countries with high regulatory quality tend to manage their resources more effectively and attract more investment, whereas those with weaker regulatory frameworks face challenges in achieving economic development and improving citizens' quality of life.

III.2.5. Classification of Arab Countries According to the Rule of Law Indicator:

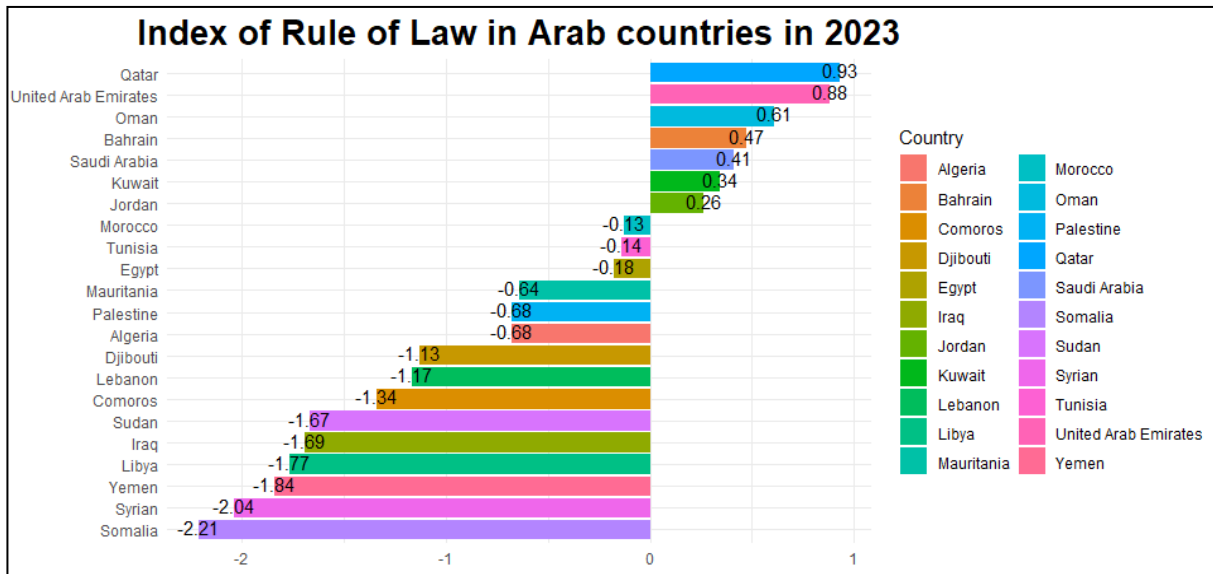
Figure (05) illustrates the ranking of Arab countries based on the Rule of Law indicator for the year 2023. This indicator highlights the extent to which legal frameworks are established and effectively enforced in each country.

The analysis reveals the presence of two main groups, reflecting the state of legal systems and institutions across the Arab world.

The first group includes countries with positive scores on the Rule of Law indicator. These are the six Gulf Cooperation Council (GCC) countries, along with Jordan. Qatar ranks highest among them. These results can be attributed to the presence of strong and effective legal frameworks in these countries, which contribute to legal stability and create an attractive environment for investment.

Conversely, the second group comprises countries that recorded negative values on the Rule of Law indicator, with Morocco leading this group, and Somalia ranking last.

Figure (05): Ranking of Arab Countries by Rule of Law – 2023

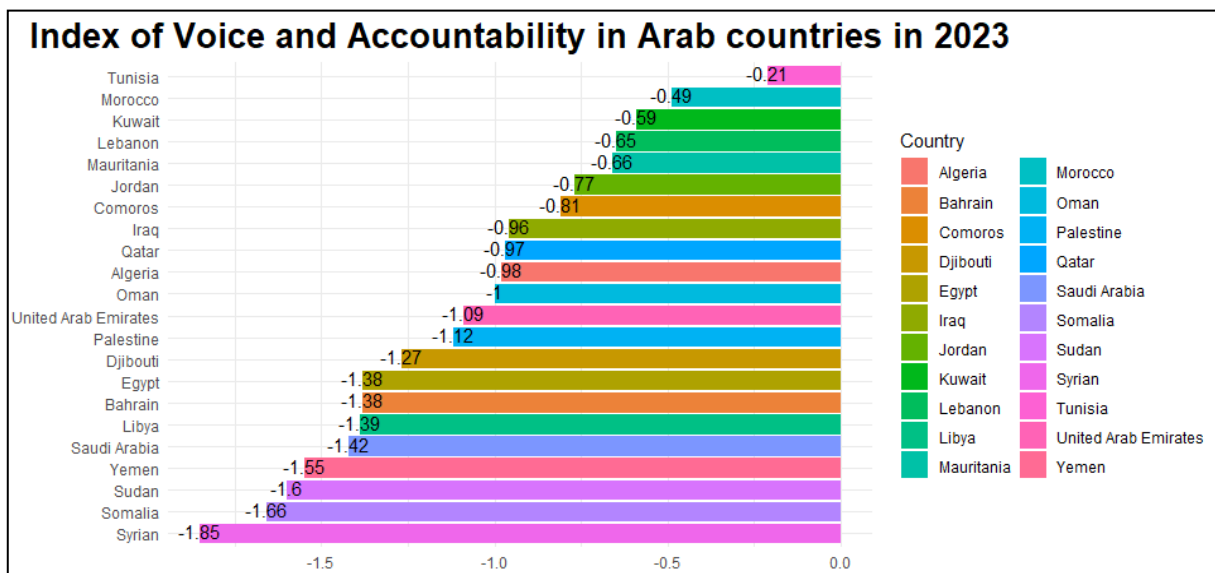


Source: Prepared by the author based on Table (01) and the R software.

This classification sheds light on the varying quality of legal environments across Arab countries. Those with strong legal frameworks are better positioned to attract investment and support sustainable economic development. In contrast, countries with weak legal systems often face challenges in ensuring legal stability and attracting external capital.

III.2.6. Classification of Arab Countries According to the Voice and Accountability Indicator:

Figure (06): Ranking of Arab Countries by Voice and Accountability – 2023



Source: Prepared by the author based on Table (01) and the R software.

A close examination of Figure (06), which presents the ranking of Arab countries based on the Voice and Accountability indicator for the year 2023,

clearly reveals that all Arab countries recorded negative scores on this indicator. This reflects the significant challenges these countries face in terms of transparency, civic participation, and institutional accountability.

Tunisia tops the ranking, followed by Morocco, due to their ongoing efforts to strengthen democratic principles and promote citizen involvement in decision-making processes.

On the other hand, Yemen, Sudan, Somalia, and Syria occupy the lowest positions in the ranking. These results are largely attributed to internal conflicts and serious security challenges, which have severely hindered democratic processes and weakened governance institutions.

This classification highlights the urgent need for substantial reforms in the areas of voice and accountability across the Arab world. Improving governance in these domains is essential for fostering transparency, encouraging citizen engagement, and building strong institutions that uphold democracy and human rights.

III.3. Classification of Arab Countries According to Governance Indicators Using Hierarchical Cluster Analysis:

Hierarchical Cluster Analysis (HCA) is a well-established technique in statistical analysis and data science. It is commonly used to group elements or individuals that share similar characteristics into clusters, through a sequence of methodical steps. The process begins with calculating distances between samples and constructing a distance matrix. Subsequently, the most similar samples are grouped into initial clusters. In successive stages, these smaller clusters are merged into larger ones by recalculating distances between them, continuing this aggregation process until all elements are combined into overarching clusters based on similarity.

Through this technique, similarities and differences among samples are identified based on shared attributes. This facilitates data organization and the extraction of patterns or meaningful classifications. HCA thus serves as a powerful tool for analyzing complex datasets with multiple dimensions and features.

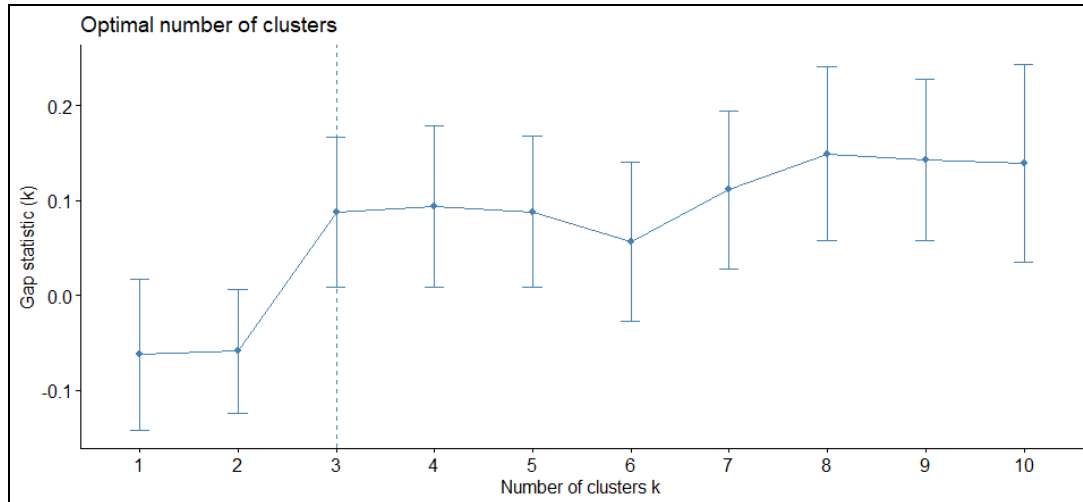
Generally, HCA enables a deeper understanding of the structure of similar data groups and provides a useful foundation for informed decision-making based on grouped data.

III.3.1. Dendrogram Structure of the Hierarchical Cluster Analysis:

In this study, the HCA is based on the six core governance indicators provided by the World Bank, as previously discussed. As a first step, we identify the optimal number of clusters to be considered in the hierarchical clustering dendrogram. Following this, the structure of the dendrogram is constructed to

visually illustrate the grouping of Arab countries according to their governance profiles.

Figure (07): Optimal Number of Clusters According to Governance Indicators for Arab Countries

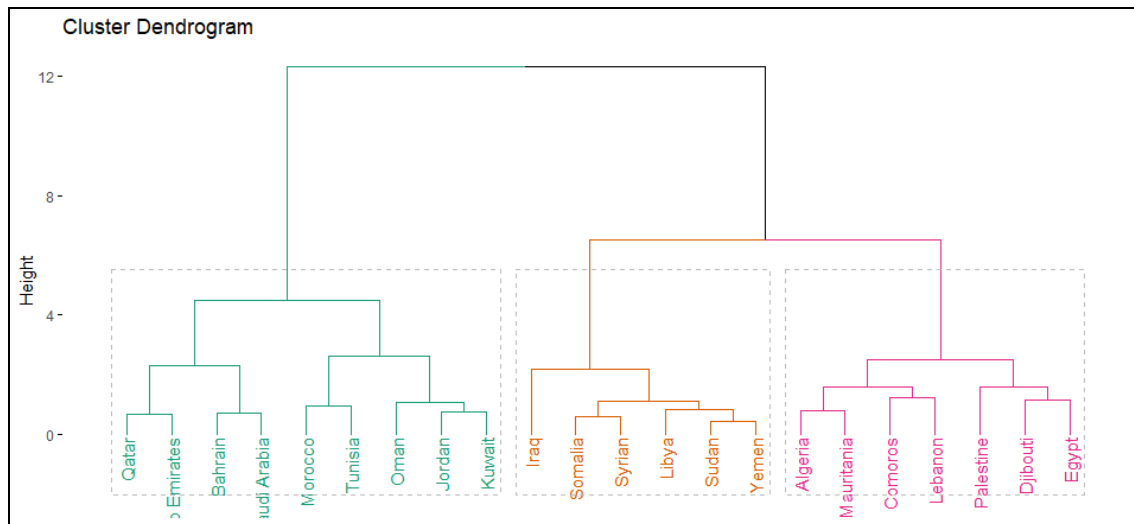


Source: Prepared by the author based on the R software.

Based on the R software, Figure (07) was obtained, showing that the optimal number of clusters for the hierarchical cluster dendrogram structure is three.

After determining the optimal number of clusters, we proceed at this stage to present the dendrogram structure of the hierarchical cluster analysis. Relying on the R statistical software, we obtained the following :

Figure (08): Dendrogram Structure of the Hierarchical Cluster Analysis



Source: Prepared by the author based on the R software.

We observe from the dendrogram structure of the hierarchical cluster analysis that it branches into three main clusters, each represented by a different color, as follows:

- The first main cluster from the right, in pink, consists of seven Arab countries;
- The second main cluster from the right, in orange, includes six Arab countries;
- The third main cluster from the right, in green, comprises nine Arab countries.

Based on this dendrogram, we can conclude that the Arab countries can be classified according to the main governance indicators into three categories, as follows:

❖ **Category 1: Leading Arab countries in governance:**

This group includes countries that have shown relatively good performance in governance indicators. These countries are: Qatar, United Arab Emirates, Bahrain, Saudi Arabia, Morocco, Tunisia, Oman, Jordan, and Kuwait. Characteristics: Most of these countries record positive or near-zero values in governance indicators.

❖ **Category 2: Promising Arab countries in governance:**

This group includes countries that display intermediate levels of governance, namely: Algeria, Mauritania, Comoros, Lebanon, Palestine, Djibouti, and Egypt.

Characteristics: Most indicators in these countries range between -0.5 and -1.5. While not highly negative like the lowest-performing group, they are not positive enough to be considered leaders.

❖ **Category 3: Low-performing Arab countries in governance:**

This category includes countries with the lowest values in governance indicators, namely: Iraq, Somalia, Syria, Libya, Sudan, and Yemen. Characteristics: Almost all indicators are highly negative, ranging from -1.5 to -2.8. These countries are facing significant governance challenges and are often affected by conflicts and instability.

III.3.2. Interpretation of the Obtained Results:

The results of the hierarchical cluster analysis highlight a significant disparity among Arab countries in terms of governance indicators. These countries have been classified into three main categories, which can be interpreted as follows:

❖ **Category 1: Leading Arab countries in governance:**

This group includes countries that have demonstrated outstanding performance across various governance indicators. This reflects the presence of effective institutional systems, efficient and transparent public administration, as well as a high level of accountability and rule of law.

❖ **Category 2: Countries with moderate governance performance:**

This category includes countries that show positive signs in governance, although they still face certain challenges. These countries are expected to experience gradual improvement in good governance indicators, especially if they adopt sustainable institutional and structural reforms.

❖ Category 3: Countries with weak governance performance:

This group comprises countries that suffer from significantly low governance indicators. This suggests an urgent need for substantial reforms aimed at enhancing government effectiveness, improving regulatory quality, ensuring the rule of law, and strengthening transparency and oversight mechanisms.

IV. Conclusion

This study aims to provide an in-depth analysis of the state of governance in Arab countries in 2023, based on the six worldwide governance indicators issued by the World Bank. The Hierarchical Cluster Analysis (HCA) technique was used to classify Arab countries into homogeneous groups according to the similarity of their governance indicators.

Through the analysis of the results, the study reached several key findings, summarized as follows:

- Governance indicators reveal considerable disparities among Arab countries. The Gulf Cooperation Council (GCC) countries, along with Jordan, recorded relatively positive performance across most indicators, reflecting a relatively stable and effective institutional environment;
- Most Arab countries still suffer from a severe weakness in the "Voice and Accountability" indicator, as all of them recorded negative scores. This reflects a lack of effective citizen participation and weak democratic accountability;
- Some countries ranked highly in the Political Stability and Absence of Violence/Terrorism indicator (such as Qatar, the UAE, Oman, and Kuwait), while others face major challenges in this area, notably Syria.

Based on the results of the hierarchical cluster analysis, Arab countries can be classified into three main categories:

- ❖ Leading countries in governance: including Qatar, the United Arab Emirates, Bahrain, Saudi Arabia, Morocco, Tunisia, Oman, Jordan, and Kuwait;
- ❖ Emerging countries in governance: including Algeria, Mauritania, the Comoros, Lebanon, Palestine, Djibouti, and Egypt;
- ❖ Countries with weak governance performance: including Iraq, Libya, Sudan, Syria, Yemen, and Somalia.

These classifications show that good governance performance is often associated with a stable regulatory environment, effective legislation, and efficient institutions. In contrast, countries with weak governance tend to suffer from deep structural and institutional crises that negatively impact development and stability.

Based on the above findings, the study proposes the following recommendations to enhance governance in Arab countries:

- Improve the effectiveness of government institutions through administrative capacity building and the adoption of modern, performance-based management tools emphasizing efficiency and transparency;
- Combat corruption comprehensively by strengthening oversight bodies and enhancing the independence of the judiciary;
- Reform the legal and regulatory framework to ensure the rule of law and legal certainty;
- Promote transparency and accountability by empowering civil society, expanding public freedoms, and ensuring freedom of expression and political participation;
- Enhance Arab and regional cooperation to exchange experiences and best practices in governance, particularly in countries that demonstrate promising indicators.

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