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DEMOCRACY IN THE ECONOMIC CONTEXT: A STUDY ON HOW DEMOCRACY IS MEASURED AND HOW IT AFFECTS ECONOMIC DEVELOPMENT

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ABSTRACT

Questo lavoro mira ad indagare il rapporto tra democrazia e sviluppo economico, analizzando come e con quale entità il livello democratico di un paese influisca sull'economia dello stesso. La tesi può essere divisa in due differenti parti, che però presentano argomenti interconnessi. Nella prima parte, dopo una breve introduzione di carattere storico e sociologico sul tema democratico, vengono descritti e analizzati i più importanti indici sviluppati per la misurazione quantitativa della qualità democratica. L'analisi viene approfondita dimostrando l'alto livello di correlazione tra questi, sia da un punto di vista di punteggio prodotto, sia da un punto di vista di rango, derivato dal punteggio assegnato. La seconda parte, comprendente il secondo e il terzo capitolo, indaga in maggiore dettaglio l'influenza che la democrazia esercita sullo sviluppo economico. Nel secondo capitolo, la narrazione si concentra sugli effetti generali e diretti, con particolare attenzione a come essi possano cambiare, influenzati dalla dimensione spazio-geografica e dalla dimensione temporale. Nel terzo capitolo, viene analizzato come la democrazia influenzi la crescita economica anche in modo indiretto, promuovendo lo sviluppo di determinati aspetti che con il loro miglioramento possono, di conseguenza, promuovere la crescita economica. La tesi si chiude con le conclusioni dell'autore.

INTRODUCTION

Democracy in the broader sense indicates a political system in which the power is in the hands of all the citizens of a determined country. The word democracy comes from the ancient Greek word *dēmokratia,* which is composed by *dēmos,* people, and *kratos*, rule[1]. It was coined in the 5th century BC in Athens, the more important city-state in ancient Greece[2], in contrast to *aristokratía,* aristocracy, the rule of the elite. Thse notion has evolved over time consistently, adapting to the evolutions of the underlying societies. Originally, it was created as direct democracy, a political system in which the people made all the rules and public decisions directly. Over time, with the growth of the society and with the appearances of the national states, it has evolved into a representative democracy in which the people elect their representative to pass law and promote public policies on their behalf. This distinction is one of the few on which the experts all agree on. Given the fact that there is no absolute definition of democracy, inside the scientific community, diverse ways are adopted to define the concept. One way is through the description of what it is not: democracy is not autocracy or dictatorship[3], where one person has all the power and it is not oligarchy, where only a small segment of the population rules. From a theoretical standpoint,

[1] https://www.britannica.com/topic/democracy
[2] https://www.coe.int/en/web/compass/democracy
[3] Aristotele is the first philosopher to present this view. In modern times this theory has been adopted by Karl Popper in *Open Society*, Routledge, London, 1945.

democracy is also not the "rule of the majority" when the minority is ignored. The opposite way can also be used to define democracy. One of the most cited definitions is from Schumpeter that describes it as *"the institutional arrangement for arriving at political decisions in which individuals acquire the power to decide by means of competitive struggle for the people's vote"*[4]. This is a broad definition that highlights how the power is on the people side and it is exercised through the instrument of the vote to select officials with the task of pass law and make public policies. This definition also reflects the instrumental approach, underlying the work of this great 20th century economist. Democracy, according to him, cannot be the goal but it is only a way, the best way, to achieve ulterior targets. Other approaches have been used in literature, in search of the best definition of democracy. One quite relevant is the procedural approach[5]. Scholars that use this method are interested in democracy work, from access to government offices via clean, inclusive, and competitive election to government decision-making via allocation of seats and via majoritarian rule. Even inside this approach, some significant differences emerge due to two distinct school of thought based on how democracy is conceptualized. According to the majoritarian

[4] SCHUMPETER J., *Capitalism, Socialism and Democracy*, New York: Harper and Row, 1970, (originally published in 1942).
[5] MUNCK G. L., *What is democracy? A reconceptualization of the quality of democracy*, Democratization, 2014.

conception, democracy is based on political freedom[6] and political equality[7] so that each structure of democracy should reflect these two principals. One of the most cited aspects is proportionality inside the electoral law. Distinct from this approach, is the juridical-constitutional conception. The main idea behind, is that there cannot be democracy without rule of law, so that even democracy should be subordinated to it. Elected officials should be checked by external counter-power, to replace the political arbitrariness, promoted by the majoritarian conceptualization, with judicial arbitrariness.

Other aspects need to be considered when democracy is discussed.

First is to evaluate the role of civil society[8] and its relationship with democracy and elected officials. In some way, civil society, especially when properly developed, can be considered an intermediate level of governance between the citizens and the state. A viable civil society can also be helpful as institution of conflict management and promoting the quality of citizenship, helping elected officials, not overburdening them with demands.

[6] Political freedom is defined as "citizens should have the ultimate control over what issue are decided through the decision-making process".
[7] Political equality is defined as "all citizens should have equal weight in the making of legally binding decisions".
[8] SCHMITTER P. C., KARL T. L., *What democracy is ... and is not*, Journal of Democracy,2, 1991, 75-88.

Another important quality to analyse, to determine what democracy is, is the social environment of politics[9]. This environment represents at the same time the underlying structure in which democracy is implanted, and the main target of elected officials inside democracy. This ambivalence is object of continuous debate inside the literature, some authors prefer to include it, or at least a part of it, inside the overall concept of democracy, while some other authors prefer to leave it out, describing this aspect as something propaedeutic to democracy but not an integral part of it. Regardless of the choice made, it is important to understand what constitute this social environment of politics[10]. It is composed by two distinct characteristics, civil rights, and socio-economic conditions. The former, often introduced in discussion of democracy, typically encompass freedom of expression, association, assembly, and access to information. Those rights are considered so important that often are defined by experts as "primary rights"[11]. The other aspect, the socio-economic conditions, less frequently inserted in democracy discussions, refers to the possible consequences the social and economic inequality on political inequality.

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[9] MUNCK G. L., *What is democracy? A reconceptualization of the quality of democracy*, Democratization, 2014.
[10] MUNCK G. L., *What is democracy? A reconceptualization of the quality of democracy*, Democratization, 2014.
[11] DWORKIN R., *Is democracy possible here? Principles for a new political debate*, Princeton University Press, 2006.
FERRAJOLI L., *The normative paradigm of constitutional democracy*, Res Publica, 17, 2011, 355-367.

Finally, what is important to remember is that democracy is not an object, immutable in time and space, with fixed characteristics, but is a construct, a human construct. Being a product of agreement between people, it is the reflection of the very people that are subordinated to it. It reflects the culture and the values of the citizens, and it changes accordingly, as possible to understand when the history of democracy is considered.

Democracy, as we know it, is the result of more than two thousand years and countless evolutions happened to it in Europe and in its near territories. Nevertheless, democratically governed national entities, remained exceptions at least until the begin of the 19th century.

During this century, with the introduction of different forms of suffrage, some democracies began to rise. This first wave of democratization, as described by Huntington[12], peaked in 1918 when 29 democratic state were registered around the Atlantic. Like all human institution, democracy need to be continuously updated with the citizens, and it is never static. Democracy can improve but also can degenerate. In history, these trends tend to involve more states almost simultaneously and it has the tendency to spread across countries, so that different scholars like to talk about wave of democratization, to describe *"a group of*

[12] HUNTINGTON S. P., *The third wave: Democratization in the late twentieth century (Vol. 4),* University of Oklahoma press, 2013.

transitions from nondemocratic to democratic regimes that occur within a specified period of time and that significantly outnumber transitions in the opposite directions during that period of time."[13], and wave of autocratization[14], to describe determined period of time where sustained and various democracy degradation processes happen. As shown in the figure below, every democratization wave is followed by an autocratization wave.

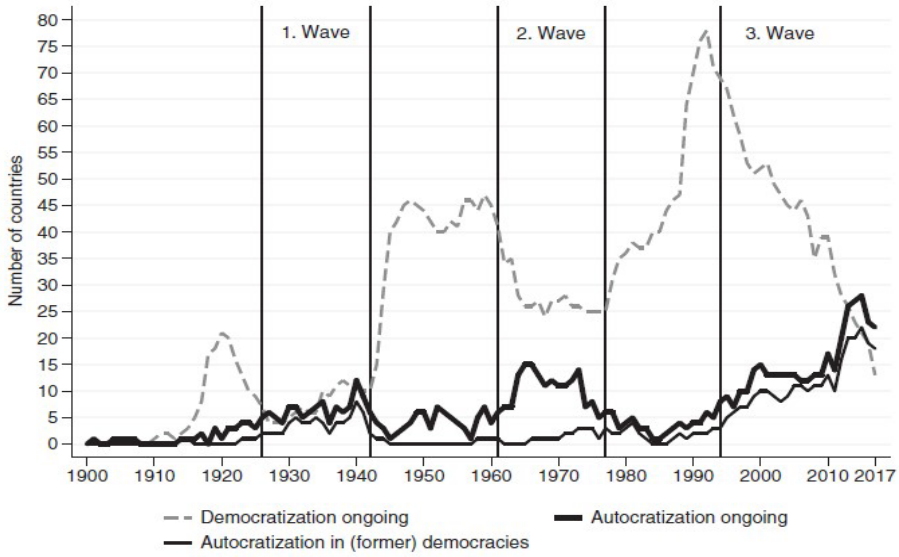

FIGURE 0.1. DEMOCRATIZATION EVOLUTION IN THE 20TH AND 21ST CENTURIES[15].

[13] HUNTINGTON S. P., *The third wave: Democratization in the late twentieth century (Vol. 4),* University of Oklahoma press, 2013, 15.
[14] LÜHRMANN A., LINDBERG, S. I., *A third wave of autocratization is here: what is new about it?*, Democratization, 26(7), 2019, 1095-1113.
[15] Figure taken from LÜHRMANN A., LINDBERG, S. I., *A third wave of autocratization is here: what is new about it?*, Democratization, 26(7), 1095-1113, 2019. In the figure the black lines highlight the temporal extension of each wave of autocratization.

From this figure, several aspects can be observed. First, democratization has been a common increasing trend of all the 20th century, even if with different strength during time. Since the last decade of the previous century, it has lost power while an autocratization wave has gained traction, so that in 2017 more were the countries undergoing an autocratization process than countries where a democratization process was taking place[16]. Is important to note that the third wave of autocratization that we are living today, in contrast to the previous two where the processes were most of the time abrupt and accompanied by violence, is characterized by more gradual, protracted in time and based on misinformation, autocratization processes[17]. These slow and often mostly legal transitions are responsible for increased examples of "illiberal democracy"[18], a political system where autocrats have subverted electoral standards without break completely the democratic façade. The urgency of this matter is so strongly felt that the concept of liberal democracy, a political system where the democracy is recognized both *de jure* and *de facto,* has now been increasingly used in academic works instead of

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[16] Is important to note that here are considered the dynamic phenomena of changing levels of democracy. Nowadays for the first time in history, even if more autocratization processes are happening, most states around the world are democracy.
[17] V-DEM INSTITUTE, *Democracy report 2022 Autocratization changing nature?*, University of Gothenburg, 2022.
[18] ZAKARIA F., *The future of freedom: illiberal democracy at home and abroad (Revised Edition)*, WW Norton & company, 2007.

the more relaxed concept of electoral democracy, where a state to qualify just need to recognise democracy *de jure*.

To make even more pertinent the distinction described just now, the Covid-19 pandemic has and still is putting democracies all around the world under intense pressure. The overall effects on democracy of this unprecedented shock are still to be determined and more time will be needed to fully appreciate the evolutions. Nevertheless, some preliminary studies are being conducted and the first findings are indirectly confirming the progression of illiberal democracies. Lewkowicz et *al.*[19] demonstrate that higher levels of democracy[20] have led to lower risk of democratic backsliding at least in the first two waves of the pandemic in 2020. According to Freedom House[21] the primary areas where Covid is doing more damages to democracy are transparency, freedom of expression, and legislation. Under intense pressure to tackle the crisis, governments all around the world have sacrificed transparency to increase the speed of reaction, they have limited freedom of expression in the larger sense to try and prevent the spread of the

[19] LEWKOWICZ J,. WOŹNIAK M., AND WRZESIŃSKI M,. *COVID-19 and erosion of democracy*, Economic Modelling, 106, 2022.
[20] The authors in their study use two variables, democracy and rule of law, to analyse the reactions of the institutions to the pandemic shock. Democracy is measured as electoral democracy, so democracy *de jure*, but if democracy and rule of law are taken together, it is possible to consider democracy as both *de jure* and *de facto*.
[21] REPUCCI S., SLIPOWITZ A., *Freedom in the World 2021: Democracy under Siege*, Freedom House, 2021.

virus, and they have passed emergency legislations to have more room to manoeuvre, suspending some democratic checks.

We are still living under the menace of Covid-19 while new treats to the global stability are emerging, most relevant the Russian invasion of Ukraine[22]. After years of faith in the democratic progress and diffusion all around the world, in recent years we are witnessing to a reversal, more democracies are turning into autocracies while already established autocracies are increasing their power and extending their influence on their neighbours[23]. In the figure below is reported the democracy level of each country of the world, using the Liberal Democracy Index (LDI), an index published by the V-Dem institute, and it computes on a range from 0 (most autocratic) to 1 (most democratic) the level of the *de facto* democracy where the electoral component of democracy and the rule of law are both considered[24].

[22] The war started the 24th of February and during the writing of this work the hostilities are still underway.
[23] For the interested reader, both Freedom House and V-Dem institute are very good sources for this kind of information.
[24] For a more rigorous definition of the Liberal Democracy Index see V-DEM INSTITUTE, *Structure of V-Dem Indices, Components, and Indicators*, University of Gothenburg, 2022.

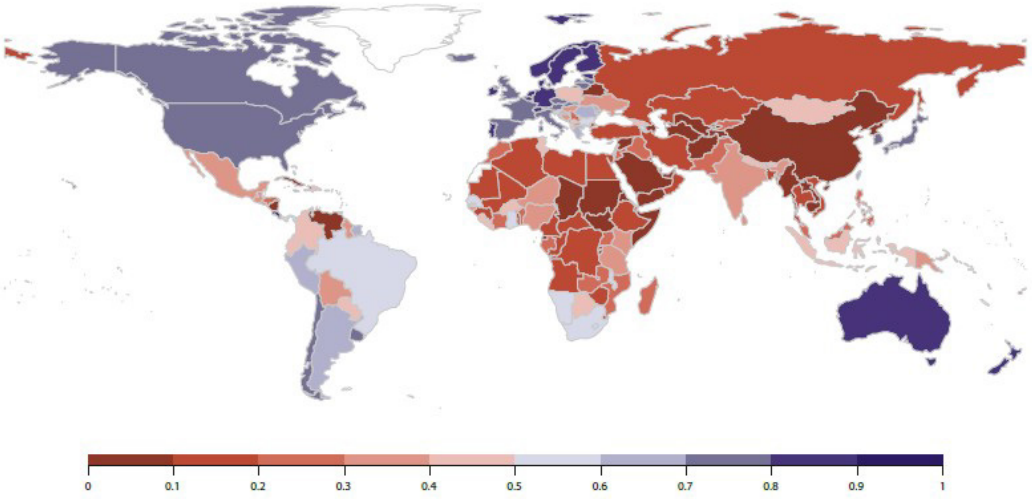


FIGURE 0.2. WORLD DEMOCRACY STATUS 2021[25]

This figure confirms this wave of autocratization, offering a picture of the world where only very few states are described as truly effective democracies, while the majority, especially developing and least developed countries, are awarded incredibly low scores.

Even if, as explained above, democracy is facing the most challenging time since the second world war, what the world is experiencing is still a period where democracy is the predominant way of government around the globe. One ideological aspect must be considered to better understand the present situation. In the Western world democracy is considered to be essential in the structure and

[25] Figure taken from V-DEM INSTITUTE, *Democracy report 2022 Autocratization changing nature?*, University of Gothenburg, 2022.

development of every state[26]. In other parts of the world, the democratic ideology is less diffused or interpretated differently. The most evident case is the People Republic of China where the developing of democracy has been left behind in favour of economic development. While this second approach is diffused mostly in Asia and it is limited to relative few countries, the predominant Western way of thinking has over time permeated most of the major international economic agents, especially the International Monetary Fund (IMF) and the World Bank so that every time a country enters in contact with these organisations, some democratic reforms are required or promoted by those organizations. This way of doing things, according to the author, has been an extraordinarily strong incentive to the democratic spread worldwide.

Given the increasing pressure by the world community to increase democratic institution around the world, it is interesting to understand which are the effects of the introduction or the development of democracy in the economic context of each country. What this thesis wants to uncover is the relationship between democratic institutions and economic development to understand if these two aspects are linked between each other, and if the answer is positive, to understand what this link may be. This study is based exclusively on economic valuations so that all

[26] This approach has been taken into consideration, nowadays, also in the Western world due to the astonishing economic success of China. An example is BELL D. A., *The China Model: Political Meritocracy and the Limits of Democracy*, Princeton University press, 2016.

ideological and sociological themes and implications will not be treated by this work.

The following parts are organized as follows: in the first chapter will be analysed and explained how democracy is measured quantitatively, with particular attention to the measurement's application in economic studies, in the second chapter the actual link between democracy and economic development will be described, following a drafted yet quite selective approach, while in the third chapter, the indirect effects of democracy on growth will be analysed. Finally, this work ends with the conclusion of the author.

I. MEASURING DEMOCRACY

I.1 DEFINING DEMOCRACY

To better understand democracy and its role in the world, how it affects any human sphere, and most relevant for this thesis, how affects the economy, it is essential to be able to quantitatively measure it with a sound conceptual framework underneath. Having established that a unanimous definition for democracy does not exists, some choices must be made to be able to measure democracy and its quality.

Two major challenges must be considered[27]. The first one is to select which institutional dimensions are associated with "democracy". The other one is to establish how these features interact with each other. Regarding the institutional composition of democracy, in the literature three types of concepts are distinguished: the *narrow* or *minimalistic* concept which mainly focuses on public and competitive elections for political posts, the *realistic* concept which additionally require recognised basic political rights and universal suffrage, and the *broad* or *maximalist* concept which also encompass other socioeconomic aspects like civil rights or inequality. Once decided what to include in the

[27] The following nomenclature is taken from GRÜNDLER K., KRIEGER T., *Using Machine Learning for measuring democracy: A practitioner's guide and a new updated dataset for 186 countries from 1919 to 2019*, European Journal of Political Economy, 70, 2021

democracy concept, is important to analyse how those selected features interacts with each other. Two different approaches can be employed: the *reflective* approach which assumes that all the features are, at least partially, substitutes and resulting from a common factor, and the *formative* approach which threats every institutional dimension as a necessary condition of democracy.

Having presented all these concepts and approaches, what emerges is that, as said at the beginning, there is not a unified definition of democracy.

From a research standpoint, not having a fit-all definition of the concept can cause some difficulties, especially when quantitative studies are to be conducted or in case of comparison between different studies. Two major situations need to be analysed: what to measure and how to measure it to get a quantitative measurement, and how to compare the results obtained using different methods of measurement.

I.2 **DEMOCRACY MEASUREMENT**

In literature the most used method to quantify democracy is by indexes. As explained in the previous paragraph, due to the changing definition of democracy, during time different indexes have been produced. Some of them are still used, maybe with some developments while others are seldom employed in modern

studies[28]. Several factors contribute to the fate of indexes. First, some are continuously adjourned with new data while other are not. Moreover, the way of construction of some indexes are improved over time while other indexes has been constructed in the same way since the introduction in the scientific field. Finally, given their different composition they tend to express different concept, so that different indexes are used in different works according to the conceptual background of each study. Nevertheless, all the major indexes in literature have a well-developed and transparent construction process so that every person interested can appreciate and study the underlying process. What is essential from the research standpoint is the good understanding of what each index really indicates and how it has been constructed, to do not have any conceptual error in the work and to select and use the most appropriate measure for the research conducted.

Given the fact that in the following parts of this work different indexes will be used and cited, to help the reader fully understand all the concepts and all the implications developed in the following parts, in the following part is presented a description of the underlying process for index construction, followed by an explained list of the most famous indexes.

[28] For a comprehensive list of the most popular indexes see GRÜNDLER K., KRIEGER T., *Using Machine Learning for measuring democracy: A practitioner's guide and a new updated dataset for 186 countries from 1919 to 2019*, European Journal of Political Economy, 70, 2021

I.2.1 Underlying process for index creation

The classical approach used to create and compute an index consists of three sequential steps[29]. The first step, called *conceptualization*, indicates the choice of how to define a democratic regime. The second step, called *operationalization,* on the key components of the chosen democracy definition, identifies the set of observable variables of the regime. The third step, defined as *aggregation*, consists in finding an objective rule to transform the observed variables into a unidimensional measure.

I.2.2 Conceptualization

In this first step, the goal is to identify the wanted definition of democratic regime. As said before, given the fact that there is no unanimous agreement of what constitute democracy, different possibilities and approaches can be chosen. The choice must be done following the theoretical structure and the practical aspects that the index must investigate. Each approach has its merits and its issues. Starting from the *maximalist* approach, adding too many attributes may cause two potential drawbacks. On one hand, overburdening the concept may cause the concept to have no empirical referents, making it less useful. On the other hand, even if some empirical referent can be found, the maximalist definitions, due to their overburdening, tend to be use truly little in analytical frameworks. The main

[29] MUNCK, G. L., VERKUILEN, J., *Conceptualizing and measuring democracy: Evaluating alternative indices*, Comparative political studies, 35, 2002, 5-34.

reason for that is thew probability of overlap with other aspects in analytical frameworks, like economical aspects such as economic freedom or rule of law. On the other part of the spectrum, there are *minimalist* definitions. Those do not present the issues explained before so that they found more space in empirical and econometric frameworks. Nevertheless, they present other disadvantages. There is the possibility that the concept may be too minimalist, causing all cases to be instances, so that researchers are obligated to add other dimensions to better represent the real situation. Moreover, selecting only few dimensions can lead to the omission of important attributes. Finally, a continuous range of definitions exists between those two extreme cases. As explained before, each author will choose the theoretical structure more suitable to him that better represents in its view a democratic regime.

Looking at the scientific literature most of the indexes used, especially in quantitative studies, tend to apply partially expanded version of the minimalist approach[30]. Those indexes that have a more maximalist approach, usually are published together with a series of sub-indexes to facilitate the analysis of different components inserted inside the overall index.

[30] During the extensive researchers conducted by the author to develop this work, very few are the cases where minimalistic indexes were used in the main econometric framework.

After having selected the attributes to define democracy, to guarantee the theoretical soundness and the practical relevancy of the indexes, it is essential to analyse the relationships between the selected features. Two distinct evaluations must be made. Firstly, trough the development of the concept tree, it is possible to determine the vertical organization of attributes by level of abstraction.

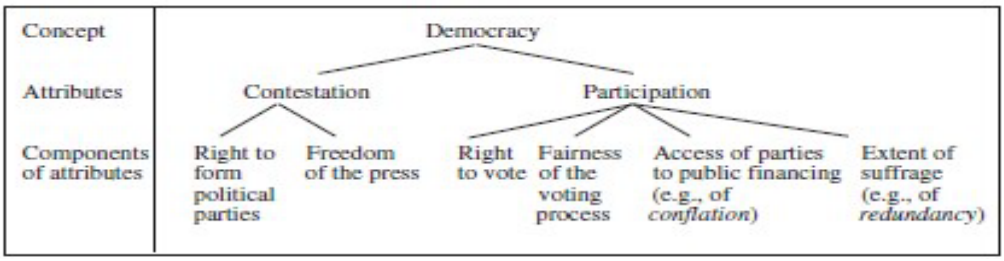


FIGURE I.1 THE LOGICAL STRUCTURE OF CONCEPTS

As shown in the figure[31], this is a process of disaggregation where the most concrete parts of the attributes, labelled as leaves, are the starting point for the effective measurement. It is important to note that attributes at the same level of abstraction should have mutually exclusive dimensions of the upper level of abstraction to guarantee protection against the problem of redundancy. Having redundancy implies not be able to fully distinguish the components of attributes between each other, causing deterioration of the theoretical quality of the index computed with this process. Finally, it is also crucial to understand the horizontal

[31] Figure taken by MUNCK, G. L., VERKUILEN, J., *Conceptualizing and measuring democracy: Evaluating alternative indices*, Comparative political studies, 35, 2002, 5-34.

relationship between the components of the chosen concept of democracy. Two different approaches can be used: the *formative* approach in which each component or institutional aspect is constructive, necessary condition of the concept, and the *reflective* approach in which the components are considered as "results" of the common factor and at least partially substitutes of each other[32]. Both these approaches have their merits and there is no uniquely recognised answer of which approach should be used. Nevertheless, it is imperative that both users and providers have clear in mind which approaches is used. For the former, because this decision has a significant role in the interpretation of the empirical results that must be consistent with the underlying theoretical assumptions. For the latter, because the choice of a determined approach influences several decisions during the aggregation process.

I.2.3 Operationalization

The goal of this second step is the formation of measures of the previously selected and disaggregated attributes. The starting points for these measurements are the leaves of the concept tree and this poses a first challenge since rarely the leaves are directly observable. To solve this problem a measurement model need to be created to relate to the unobservable variables to some observable

[32] TEORELL J., COPPEDGE M., LINDBERG S., & SKAANING S. E., *Measuring polyarchy across the globe, 1900–2017*, Studies in Comparative International Development, 54(1), 2019, 71-95.

indicators[33]. These selected observable variables are difficult to choose, and no golden rule exist how to lead the selection. However, some small indications can be followed to help in the selection process. On one hand, to avoid potential bias or error to be able to use the measures for cross-time and cross-space comparisons, it can be helpful to select multiple indicators. On the other hand, the bigger the number of indicators used, the more difficult becomes for the analysts to establish the equivalence of diverse indicators. A further complication in the operationalization phase, is the possibility of failure in appreciate the inescapable nature of measurement error. This is often generated by the availability or accessibility of data. One clear example to better understand the concept of measurement error is that increased evidence of corruption may be a reflection of increased freedom of the press instead of an actual increase in corruption. A solution to this problem can be to choose indicators that can be cross-checked using diverse sources.

In the practical application of this phase two solutions are jointly applied. To solve the problem of unobservable variables, expert-based sub-indexes can be created for each attribute. Given their subjective score, they can cover any regime and any period. Obviously, being based on evaluation of human beings, they can

[33] MUNCK, G. L., VERKUILEN, J., *Conceptualizing and measuring democracy: Evaluating alternative indices*, Comparative political studies, 35, 2002, 5-34.

be biased by the personal experience or interests of the analysts and the subjective assessments can vary, even considerably, between coders. To mitigate these biases, it is customary to complement these sub-indexes with objective indicators based on measurable regime characteristics. Those, nevertheless, are often afflicted by the scarcity and sometimes by the low reliability of the data.

I.2.4 Aggregation

In this last phase, all the indicators computed in the last phase are aggregated into a single score representative of the level of democracy. The most important challenge is to identify the more congruous and coherent aggregation function. This method must be the reflection of the previously chosen and organised concept tree. For example, if there is the need to aggregate two attributes and one's theory indicates that they both have the same weight, one could simply add the scores of both attributes. Instead, if one's theory suggests that both attributes are necessary features, one could multiply the scores, and if one's theory describes both attributes as sufficient features, it could be taken the score of the highest attribute[34].

[34] An interesting case to be highlighted is the recent tendency to introduce modern computational methods like the Support Vector Machines (SVM) to develop innovative and always more complex aggregation methods. For a practical example see paragraph "*Machine Learning democracy index"* in the following pages.

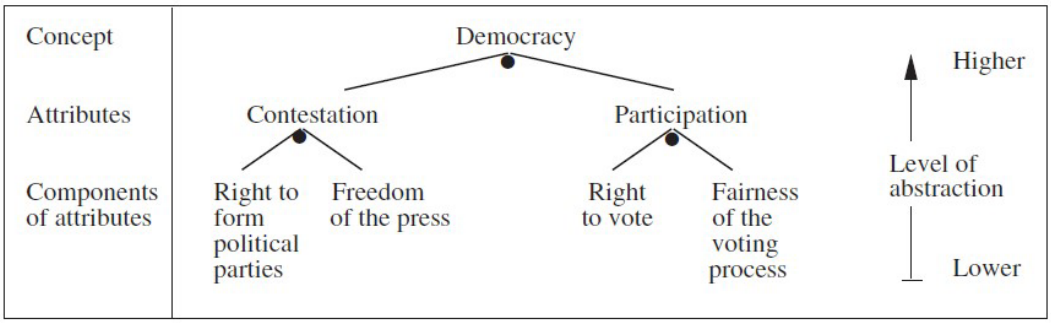


FIGURE I.2 PROCESS OF AGGREGATION[35]

Aggregate all the data into a unidimensional index can be very helpful when a straight value or indication is need even if this causes evident loss of information. To mitigate this situation several providers, publish together with the overall index, a set of sub-indexes related to specific attributes.

The other crucial decision to make in this phase is to choose the scale of the index. In literature four types of scaling exist: *dichotomous* scales in which the index can only assume two alternative values, representing democracy or no democracy, *ordinal* scales in which the results are ranked and order without showing the actual difference between every level, *graded* or *semi-continuous* scales in which the index can vary inside a specific range and assuming only prefixed values, and *continuous* scales in which the index can assume every value inside the prefixed range. There is no better or worst scale given the fact that each

[35] Figure taken from MUNCK, G. L., VERKUILEN, J., *Conceptualizing and measuring democracy: Evaluating alternative indices*, Comparative political studies, 35, 2002, 5-34.

has its own merits. Dichotomous and ordinal scales tend to perform better on theoretical ground while continuous and semi-continuous scales tend to advantage in the empirical prospective given their greater discriminating power.

The importance of the aggregation function combined with the choice of the scale is crucial and it need to be highlighted, given the fact that especially between users those aspects are often neglected. To support this claim Gründler and Krieger[36] have shown that both the aggregation function and the chosen scale can influence results in econometric estimations, specifically OLS and 2SLS regressions.

Having explained the complex theoretical process to construct democracy indexes, to allow the reader to better capture all the implications of the following paragraphs, below is introduced an explained list of the most used democracy indexes.

I.3 **POPULAR DEMOCRACY INDEXES**

In this section six different democracy indexes will be analysed and explained. The selection is done by the author. Two major aspects have been considered to

[36] GRÜNDLER K., KRIEGER T., *Should we care (more) about data aggregation? Evidence from the democracy-growth-nexus*. CESifo Working Paper No. 74800, 2020

make the choice: the index's use in economic and econometric papers, and the theoretical and practical construction process of the index[37].

The indicators reported are the following: Polity IV indicator, Freedom House indicator, V-Dem's Polyarchy index, The Economist Intelligence Unit's index of democracy, effective democracy index, and Machine Learning democracy index.

I.3.1 Polity IV indicator

This indicator created by Marshall & Jaggers[38], more than twenty years ago inside the "Centre of Systematic Peace" and updated annually is a quasi-continuous index with a prefixed range that goes from -10 (most autocratic) to +10 (most democratic). The democracy concept applied to construct this index is quite broad. According to the authors, five institutional aspects are the pillars of a democratic regime: constraints of chief executive, competitiveness of the chief executive recruitment, openness of the chief executive recruitment, regulation of participation, and competitiveness of participation. Each aspect is evaluated with the creation of specific sub-indexes. It is important to note that only countries with more than 500,000 inhabitants are evaluated, so that all micro-states are excluded

[37] The selection done by the author is based on his personal research. The list doesn't exhaust all the democracy indicators, and this would be out of the scope of this work. For a more comprehensive list GRÜNDLER K., KRIEGER T., *Using Machine Learning for measuring democracy: A practitioner's guide and a new updated dataset for 186 countries from 1919 to 2019*, European Journal of Political Economy, 70, 2021

[38] MARSHALL M., GURR T.R., JAGGERS K., *Polity IV Project. Political Regime Characteristics and Transitions, 1800-2015*, Center of Systematic Peace, 2019.

from the computation. Finally, the sub-indexes are aggregated following an additive procedure.

This index is vastly used in the scientific literature due to its extensive cover; it starts evaluating countries in 1800, and its strong discriminating power. The latter derives from the fact that together with the main index, all five sub-indexes are published, so that it is possible to understand which aspect is more influential and to observe the effect of the aggregation function on the estimations. Additionally, thanks to its extensive use in research, it is extremely helpful when comparisons between different models or studies must be made.

However, the Polity IV index presents some issues that must be considered in its application. First, due to its overly broad democracy concept, the index tends to overlap with other institutional factor, an important aspect to consider especially during the creation of econometric models. Moreover, some difficulties could emerge when creating models, especially those with extensive time coverage, because the computation of the indicator is suspended when a country is occupied by another country or when the country has no government or has a transitional government. Finally, regarding the measurements and the aggregation methods some critical point emerges. One is the fact that Polity IV does not provide confidence interval for its index so that it is not considered any potential

measurement error. The other is that due to the additive approach some doubtful classification at the lower end of the spectrum can occur.

Summing up, the Polity IV democracy index is the most used democracy indicator[39] in econometric models even if as explained before it presents some issues. It is important to always keep in mind those, together with the underlying democracy concept, to truly understand the results obtained through models or estimations.

I.3.2 Freedom House indicator

Freedom House since the 1950s has produced and published two democracy indexes. The first one has a quasi-continuous scale with a range from +2 (most democratic) to +14 (most autocratic), while the second has an ordinal scale with three categories (free, partly free, not free). The ordinal index is just a conversion of the quasi-continuous index, so it is based on the same data, and it is computed with the same aggregation method.

The democracy concept underlying the Freedom House index is quite maximalist. It encompasses not only political rights but also some civil liberties. Moreover, it is considered the real implementation of both political and civil rights[40]. To fully

[39] COLAGROSSI M., ROSSIGNOLI D., MAGGIONI M. A., *Does democracy cause growth? A meta-analysis (of 2000 regressions)*, European Journal of Political Economy, 61, 2020.
[40] *Freedom in the World 2022 Methodology*, 2022

measure these two aspects Freedom House develops two different sub-indexes: political rights (PR) and civil liberties (CL). They both analyse different regime characteristics, PR ten while CL fifteen. All are evaluated by expert-based measurement with a score between 0 (the best) and +4 (the worst). Afterwards, the scores are summed together and then transformed into a 1 to 7 scale as shown in the table below.

TABLE I.1 PR AND CL COMPUTATION[41]

	+1	+2	+3	+4	+5	+ 6	+7
PR index	36–40	30–35	24–29	18–23	12–17	6–11	0–5
CL index	53–60	52–44	35–43	26–35	17–25	8–16	0–7

The final quasi-continuous indicator is just the sum of PR and CL. The data, as explained before, is also converted in an ordinal indicator with three distinct categories.

[41] Table taken from GRÜNDLER K., KRIEGER T., *Using Machine Learning for measuring democracy: A practitioner's guide and a new updated dataset for 186 countries from 1919 to 2019*, European Journal of Political Economy, 70, 2021

TABLE I.2 CONVERSION FROM QUASI-CONTINUOUS SCALE TO ORDINAL SCALE[42]

Status	Political Rights score						
Civil Liberties score	0-5*	6-11	12-17	18-23	24-29	30-35	36-40
53-60	PF	PF	PF	F	F	F	F
44-52	PF	PF	PF	PF	F	F	F
35-43	PF	PF	PF	PF	PF	F	F
26-34	NF	PF	PF	PF	PF	PF	F
17-25	NF	NF	PF	PF	PF	PF	PF
8-16	NF	NF	NF	PF	PF	PF	PF
0-7	NF	NF	NF	NF	PF	PF	PF

F = Free, PF = Partly Free, and NF = Not Free

As shown in the table above, there is an extremely specific and formal system of conversion. Countries with a score equal or below +5 are described as *free*, countries with a score between +6 and +10 are defined as *mostly free*, and countries with a score equal or above +11 *not free*.

The FH index has different merits. First, it has an extensive geographical coverage, with 210 between countries and territories evaluated. In addition, it reports assessments also in period of transitions and occupied regimes, in contrast to the Polity IV index. This can be helpful in creating models without any breaks in the time series. However, even if the Freedom House stated publishing indexes from the 1950s, this index's database starts only in 1972, so that long chronological regressions are impossible to conduct. Another important aspect to be considered is the fact that the underlying democracy concept is maximalist.

[42] Table taken from *Freedom in the World 2022 Methodology*, 2022

This can be a positive aspect because in constructing the indicator various data is included adding value to the measurement. From the opposite standpoint, employing such a maximalist concept implies the possibility of overlaps with other concepts or institutional aspects. In literature, to limit the overlapping, it is often used only the PR indicator that represents a more restricted version of democracy. however, this is not a perfect solution since inside the PR index there is also political corruption that can be the cause of overlap with other institutional aspects. Regarding the measurement and the aggregation function some aspects are worth mentioning. As Polity IV, no confidence interval to cover measurement errors are indicated. Moreover, users must be aware that the threshold values are set arbitrarily without any theoretical explanation. Nonetheless, these values are constant and rigid over time allowing for a perfect time and space comparison, extremely helpful in the applied research. Finally, some transparency issues arise on the aggregation function since the expert-based evaluations are made public available only from 2006 onward.

In conclusion, the Freedom House democracy index even if it has its problems, as any democracy index, it represents one of the most valuable and explanatory democracy indicators so that, when it is not used in the studies in the primary models, it is often always used as variable in the robustness regressions.

I.3.3 V-Dem's Polyarchy Index

The Polyarchy index is the key democracy indicator produced by Varieties of Democracy (V-Dem), an international research project who aim to provide information on institutional aspects on all the world's countries. In its database are covered 450 regime characteristics through five different indexes, all derived from the Polyarchy democracy index. This continuous indicator covers 202 countries in the period from 1798 onward. Introduced in 2018[43], it presents very innovative traits. The underlying democracy concept is "realistic", a compromise between minimalist and maximalist concepts. It is composed by political rights and some basic freedoms to describe a true electoral democracy without including more demanding features such as rule of law to avoid overlapping. Five institutional components are included in the democracy definition: elected officials, free and fair election, associational autonomy, inclusive citizenship and freedom of expression and alternative source of information. Elected officials is treated as a formative feature, a component that constituted a fundamental factor to democracy while the other four aspects are treated as reflective features, as "effects" of the main concept. To measure these elements a radical disaggregation is applied to the point that 40 sub indicators are introduced. To analysed "inclusive citizenship" the data about universal suffrage is looked at. This

[43] TEORELL J., COPPEDGE M., LINDBERG S., SKAANING S., *Measuring Polyarchy across the Globe, 1900-2017*, Studies in Comparative International Development, 54(1), 2019, 71-95.

represents the only objective sub-indicator. The other four components are measured by expert-based sub-indexes. Those are obtained using evaluations made by five or more indigenous academics and experts on each indicator. To estimate latent country-date traits derived from the expert ratings, it is applied a custom deigned Bayesian item response theory model. To aggregate these results, an innovative approach has been developed to satisfy most of the recent literature, yet still quite divided on this process. The data measured are aggregate using two different methods: a multiplicative approach and an additive approach. The final index is then obtained through the mean of the results of these two approaches. The Multiplicative Polyarchy Index (MPI), based on the idea that all components are necessary conditions, is obtained multiplying the sub-indexes of all the components. So, MPI is computed as follow:

*MPI=Elected Officials*Clean Elections*Associational Autonomy* Suffrage*Freedom of Expression and Alternative Source of Information*

The multiplicative approach is expression of the argument that the contemporary existence all aspects is essential to define a real democracy. For example, the degree of suffrage is not relevant if there is no Associational Autonomy, if the election results are completely fabricated, or if the executive is not elected. The Additive Polyarchy Index (API) is, instead, computed based on the idea the components are like “results” so that each can influence the overall score. To not

distort the score in direction of the two components that can achieve high results only through the fulfilment of formal criteria (Elected Officials and Suffrage), a hybrid additive approach is applied.

$$API = 0.125*Elected\ Officials + 0.125*Suffrage + 0.25*Associational\ Autonomy + 0.25*Clean\ Elections + 0.25*Freedom\ of\ Expression\ and\ Alternative\ Source\ of\ Information$$

As shown in the formula above, a weighted sum of the components is done to compute the API. To avoid distortion due to causes explained before, Elected Officials and Suffrage components are weighted half compared to the other features.

Finally, the Polyarchy Index is obtained by averaging the Multiplicative Polyarchy Index (MPI) and the Additive Polyarchy Index (API) as shown in the formula below.

$$Polyarchy = 0.5\ MPI + 0.5\ API = 0.5*(Elected\ Officials*Clean\ Elections*Associational\ Autonomy*Suffrage*Freedom\ of\ Expression) + 0.0625*Elected\ Officials + 0.0625*Suffrage + 0.125*Clean\ Elections + 0.125*Associational\ Autonomy + 0.125*Freedom\ of\ Expression$$

Another revolutionary aspect of this aggregation methos is the fact that together with the scores, measurements of error are introduced, so that the Polyarchy index

comes with confidence intervals[44]. It is one of the two indexes[45] in the modern literature to have this features that allows the indicator to be shield from large part of criticisms that are posed to other democracy indexes. The only issue that emerges for this index is the lack of theoretical foundation for the averaging process between MPI and API.

In sum, the V-Dem's Polyarchy Index is a new and very innovative measure of democracy. According to the publisher, the index is very positively correlated with already existing democracy indicators, especially with Polity IV and Freedom House Index[46]. The meaning of this is that Polyarchy shows remarkably equivalent results to very established indexes, conferring to it direct validation. Some minor differences still emerge, due to more disaggregated and in dept analysis of regime characteristics conducted in the 40 indicators studied to construct the index, which allows Polyarchy to paint a more accurate e more nuanced picture of electoral democracy. Lastly is worth mentioning that Polyarchy has not been used much in published studied yet[47], likely due to its

[44] It is interesting to note that measurement error, or the confidence interval, tend to be largest for middle scores. This comes with no surprises, given the fact that it is easier to measure regimes at the extreme rather than in the "muddled middle".
[45] The other index is the Machine Learning democracy index that introduced below.
[46] For more detailed estimations TEORELL J., COPPEDGE M., LINDBERG S., SKAANING S., *Measuring Polyarchy across the Globe, 1900-2017*, Studies in Comparative International Development, 54(1), 2019, 71-95.
[47] The author, given the quality of the index has no doubt that once the academic and scientific activity will regain strength, the Polyarchy index will find its space in the literature.

recent creation and to the slowed pace of academic activities reported in the last years due to Covid-19 pandemic.

I.3.4 The Economist Intelligence Unit's index of democracy

The Economist Intelligence Unit's index of democracy is a continuous index with a prefixed range from 0 (most autocratic) to 10 (most democratic). It covers 165 states and 2 territories, while 27 micro-states are excluded. It has been rarely used in econometric research. However, it is inserted in this list because it is the pillar of the yearly The Economist Intelligence Unit (EIU) publication on the world state of democracy, and it is often cited in qualitative works.

The underlying concept of democracy adopted for the construction of the index is quite maximalist. According to the publisher[48], five are the pillars of democracy: electoral process and pluralism, civil liberties, the functioning of governments, political participation, and political culture. Civil liberties are inserted because, in the EIU theoretical background, those are essential for a real "liberal" democracy. Moreover, political culture and political participation are added to legitimize the democratic process. To measure the five categories of democracy, a total of 60 indicators are estimated using expert-based evaluation accompanied by, when

[48] KEKIC L., *The Economist Intelligence Unit's index of democracy*, The Economist, 21, 2007, 1-11.

possible, public opinion surveys[49]. This addition is quite innovative and unique, and in a way, reflects the intrinsic journalistic nature of the index publisher. Every indicator is scored with a three-point system, an expanded dichotomous scoring system where the 0.5 value is included, alongside the 0 and 1, to better investigate the "grey" areas and to enhance reliability of the process. To assign values to each of the five categories, the indicators scores are summed and then converted into a 0 to 10 scale. After some compulsory adjustments[50], the final index is computed through the simple average of the five scores. As for the Freedom House index, an ordinal scaled index with four categories is published, based on the continuous index. The threshold values are reported in the table[51] below.

TABLE I.3 CONVERSION TO ORDINAL SCALE

Ordinal scale	Range of values
Full democracy	8 – 10
Flawed democracy	6 – 7.9
Hybrid regime	4 – 5.9
Authoritarian regime	0 – 3.9

[49] Some of the most important sources are: World Values Survey, Eurobarometer surveys, Gallup polls, Latin America Barometer, and national surveys.
[50] For more details KEKIC L., *The Economist Intelligence Unit's index of democracy*, The Economist, 21, 2007, 1-11.
[51] Table developed by the author.

To limit the loss of information the EIU is used to publish together with the final score also the values of the five sub-indexes.

Some issues emerge when analysing the measurement and the aggregation process. One is the potential loss of information applying a quasi-dichotomous scale in the 60 indicators. Another often cited issue is the lack of theoretical background for the aggregation function, especially the simple mean of the five categories.

Simming up, what emerge is an articulated democracy index used predominantly in qualitative research that presents some issues in the aggregation process but, that thanks to the extensive coverage and the trustworthy publishing institution behind, has its own validity and legitimacy.

I.3.5 Effective democracy index

The Effective democracy index (EDI)[52], even if does not have much practical application in the literature is inserted in this list due to its highly innovative theoretical approach.

EDI is a continuous conditional index with a range from 0 (most autocratic) to 100 (most democratic). The conditionality implies the link between a defining propriety and conditioning quality through a conditioning treatment. To

[52] ALEXANDER A. C., INGLEHART R., WELZEL C., *Measuring effective democracy: A defence*, International Political Science Review, 33(1), 2011, 41-62.

understand this property there is the necessity to understand the underlying concept of democracy here investigated. The concept is "effective" democracy, meaning a regime where the political rights, other than be recognised by the law, are effectively put into practise. According to this definition, the defining propriety is the democratic rights in the broader sense, a quasi-maximalist approach while the conditioning quality is the rule of law. To measure these two aspects, no new indexes are computed but existing ones are reformulated. To evaluate the democratic rights a Democratic rights index (DRI) is computed. The starting indexes are taken from Freedom House. As explained before, the Freedom House democracy index is composed by two indexes: Political rights (PR) and civil liberties (CL). Both are scored on a scale from 1 to 7 and to transform the index into a 0 (most autocratic) to 100 (most democratic) scale the following formula is applied:

$$DRI = (14 - (PR + CL))/0.12$$

To measure the conditioning quality, the rule of law is used the encompassing measure of the World Bank's Rule of Law Index[53]. Since the rule of law index (RLI) will be used as a weighting factor, the index is transformed into a range from 0 (lowest) to 1 (higher) as shown below:

[53] This index measure how strictly the agent of the government abides by the laws based on expert judgment together with population surveys.

$$RLI = (COS – LOS)/(HOS – LOS)$$

COS is the country's observed score; LOS is the lowest ever observed score while HOS is the highest ever observed score. Interesting to know is the fact that, given the formula used to compute RLI, both 0 and 1 scores are not theoretical values but empirically observed extremes. To aggregate PRI and RLI into the effective democracy index, the conditioning approach of multiplication is applied. The theoretical foundation for this choice is the formative approach, in which both components are constitutive of the "effective" democracy concept.

Some critical point must be analysed to have a better understanding of the real meaning of the EDI. First, given the composite nature and the measurement approach used, it is important to consider all the problematic expressed in the previous paragraph of the Freedom House Index. Even if, the indexes are transformed in scale, the issues remain. Another important aspect to be considered is the possible overlapping and double treatment that may occur given the extensive interpretation implicitly inside both PRI and RLI. The authors of the EDI to analyse these issues, they start from the point that the overlapping part (absorbed part) of the rule of law already present inside the political rights index is actually the variance component in the rule of law that is predicted by democratic rights. From this point, two effects are observed and analysed when PRI and RLI are multiplied. One is the *rescaling* effect while the other is the *re-*

ranking effect. The former is related to the overlapping part of the rule of law. When multiplying the political index with the rule of law index, it is established mutual conditionality, changing the picture towards a more demanding assessment of democracy. The final effect is just a change in the overall valuation without any changes in the ranking of the observed countries, given the fact that all scores are influenced at the same level. Instead, the re-ranking effect, occurs in relation to the rule of law part not overlapping between the two sub-indexes. Here since, the interested feature is not symmetrical between all countries, a shifted in the overall ranking of the countries happens. The weighting procedure affects the overall scoring downgrading previously equally ranked countries due to rule of law deficiencies not absorbed in the political rights index.

The innovative process of measuring allows to investigate the democratization processes in a more detailed way. By focusing on both democratic rights and rule of law, the Effective democracy index gives a better and more realistic picture of the process, downgrading those processes where the improvements are registered only on the paper without any actual improvement experienced by the citizens. Thanks to this quality, EDI according to the authors, shows a higher postdictive validity than all the other democracy indicators for a wide set of "empowering conditions" at the social basis of democracy, such as economic prosperity, civic values, civic society, and distributional equality.

From an econometric standpoint, EDI finds almost irrelevant use because of its encompassing of quite distinct aspects that make developing a detailed model very difficult. However, the EDI is a very sound democracy index, with an innovative theoretical approach. The theoretical backbone is irrepressible, and the author of this work find it very suitable for describing the actual political situation around the world where deficiencies are observed even under fully operating electoral regimes.

I.3.6 Machine learning democracy index

The last index in this list is the more complex yet likely the best democracy indicator developed in modern times. Published for the first time by Klaus Gründler and Tommy Krieger in 2016[54], it has been partially modified and improved in 2020[55]. The index database cover 186 countries from 1919 onward and it is yearly updated. The machine learning democracy index is available on two scales: dichotomous scale and continuous scale.

The underlying concept of democracy adopted in the creation process of the index, is quite minimal. It is focused on three aspects to minimize overlapping in empirical model. Those features are political participation, political competition,

[54] GRÜNDLER K., KRIEGER T., *Democracy and growth: Evidence from a machine learning indicator.* European Journal of Political Economy, 45 (1), 2016, 85–107.
[55] GRÜNDLER K., KRIEGER T.*, Using Machine Learning for measuring democracy: A practitioner's guide and a new updated dataset for 186 countries from 1919 to 2019*, European Journal of Political Economy, 70, 2021.

and freedom of opinion. To operationalize these regime characteristics ten indicators are selected, three of those are expert-based evaluated while seven are objectively evaluated. To better evaluate the political regimes, particular indicators are chosen to consider both *de jure* and *de facto* aspects.

TABLE I.4 REGIME CHARACTERISTICS MEASURED TO COMPUTE THE MACHINE LEARNING DEMOCRACY INDEX[56]

Dimension	Regime Characteristics	Type	Description
Political Participation	Part I	Objective	Share of adult citizens with legally granted suffrage.
	Part II	Objective	Ratio between number of voters and number of eligible voters.
	Part III	Objective	Ratio between number of voters and number of inhabitants.
Political Competition	Comp I	Subjective	Measure of party pluralism.
	Comp II	Objective	Share of votes not won by the strongest party/candidate.
	Comp III	Objective	Share of parliamentary seats not won by the strongest party.
	Comp IV	Objective	Ratio between share of votes won by runner-up party/candidate and share of votes won by strongest party/candidate.
	Comp V	Objective	Ratio between share of parliamentary seats won by runner-up party and share of parliamentary seats won by strongest party.
Freedom of Opinion	FreeOp I	Subjective	Measures freedom of discussion of male citizens.
	FreeOp II	Subjective	Measures freedom of discussion of female citizens.

The real innovation of this index is the adoption of a supervised machine learning technique for pattern recognition called Support Vector Machines (SVM) to develop a better aggregation function. This technique allows the machine to uncover hidden relationships between a set of input characteristics through a preliminary analysis of so-called *priming data*, a series of input cases in which the

[56] Figure taken from GRÜNDLER K., KRIEGER T., *Using Machine Learning for measuring democracy: A practitioner guide and a new updated dataset for 186 countries from 1919 to 2019*, European Journal of Political Economy, 70, 2021.

relationships between characteristics are already known and well established. In this specific case, as priming data, are taken regimes at the extremes of democracy spectrum, both extremely democratic states and extremely autocratic states where the consensus between academics is almost complete. The distinction is formally based on two different democracy indexes: UDS (Unified Democracy Score)[57] and V-Dem's democracy index. To be classified as "highly democratic" a country needs to be in the upper decile in either of the indexes while to be "highly autocratic" a country needs to be in either lower decile. Using this machine learning to aggregate the data, the authors have been able to produce both a continuous and a dichotomous index. Both are published together with confidence intervals that reflect the extent of measurement uncertainty[58]. Important to note is that the machine learning democracy index is the first to introduce confidence intervals in dichotomous index, thanks to the innovative aggregation method.

One issue that arises in the construction of this index is the impossibility to observe the aggregation function that the machine is using to compute the scores of the index. As a result of this, it is impossible for academics and researchers to investigate how the different regime characteristics affects the overall scores of

[57] The Unified Democracy Score (UDS) continuous democracy index is composed through the combination of ten different existing indexes with Bayesian latent approach. It was not inserted into the index list of this work due to its limited application in the literature and the short length of the historical period covered.

[58] As for the V-Dem's democracy index, the wider range of the confidence intervals are localized in the centre of the democracy spectrum where hybrid regimes are concentrated.

the index. Another important aspect to be considered is the evaluation of the extremes. Due to the aggregation method's characteristics, there is the possibility that the extreme high or low scores could be overestimated. This estimate is based on the fact that almost no country is scored at the extreme in the other published indexes while some examples are present in this index.

Finally, even if some minor issues are worth reporting, the machine learning democracy index is an extremely high quality and reliable democracy indicator, thanks to the precise confidence intervals and to the very innovative yet reliable aggregation method. As said before, the index is still not very used in the scientific literature, but the author of this work is confident that soon it will receive the right attention.

I.4 **COMPARATIVE ANALYSIS**

I.4.1 Comparative table

After having described in depth the six major democracy indexes, it can be helpful to the interested reader to have a table where the main characteristics of each index are reported.

TABLE I.5 COMPARATIVE TABLE (QUALITATIVE) [59]

Name of the index	Provider	Time coverage	Space coverage	Democracy definition	Scale	Aggregation method	Confidence intervals
Polity index	Marshall et al. (2019)	1800-	167 states	Broad	Quasi-continuous	Additive	No
Freedom house indicators	House F. (2022)	1972-	210 states and territories	Maximalist	Quasi-continuous/Ordinal	Additive	No
V-Dem's Polyarchy index	Teorell et al. (2019)	1789-	202 states	Realistic	Continuous	Additive and multiplicative combined	Yes
EIU' democracy index	Kekic (2007)	2006-	165 states and 2 territories	Maximalist	Continuous/Ordinal	Average of sub-indicators	No
Effective democracy index	Alexander et al. (2011)	1972-	210 states and territories	"Effective" democracy	Continuous	Conditioning	No
Machine learning democracy index	Gründler (2019)	1919-	186 states	Minimalist	Continuous/Dichotomous	Support Vector Machines (SVM)	Yes

I.4.2 Comparative result, general introduction

To conclude this chapter, after having described all the theoretical aspects of the six major democracy indexes, an empirical analysis is conducted to investigate how the reality is represented by those selected indexes.

The analysis is conducted on data from 2018[60] and with the more extensive range of countries for which all indexes were disponible. At the end, 159 countries are taken into consideration. For the interested reader, the comprehensive table is

[59] For space coverage of Freedom House democracy index see https://freedomhouse.org/countries/freedom-world/scores. For space coverage of Polity IV see http://www.systemicpeace.org/polity/polity4x.htm. For space coverage of EDI, the authors have inserted the coverage for Freedom House because the index is computed using the FH democracy index.

[60] 2018 was chosen as selected year since from the beginning of the Covid-19 pandemic data can be not perfectly reliable. Moreover, during extensive and unprecedented crisis all countries tend to react in different ways, with different approaches. All of this could influence the comparison between indexes due to different computational methods underlying those indexes. An ulterior motive is that during 2020 the “Center of Systematic Peace”, publisher of the Polity IV index, has started to develop some changes in the computational methods of the index. Relevant for this study is the fact that data after 2018 has now been published with these innovations. Those are still experimental, so that the author of this work has preferred to use the old version, described at length above, in his empirical analysis

reported in Appendix A. Here it is reported only a fraction of the table to highlight the best performing countries and the worst performing countries, with the addition of Italy to homage the homeland of the author.

TABLE I.6 COMPARATIVE TABLE (QUANTITATIVE) [61]

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Norway	10	2	0.913	9.87	97.42	0.983
Denmark	10	2	0.888	9.22	94.00	0.979
Finland	10	2	0.855	9.14	100.00	0.992
Sweden	10	2	0.903	9.39	94.25	0.965
New Zealand	10	2	0.873	9.26	95.39	0.991
…			…			…
Italy	10	2	0.873	7.71	58.87	0.992
…			…			…
China	-7	13	0.09	3.32	4.01	0.023
Eritrea	-7	14	0.086	2.37	0.00	0.035
Syria	-9	14	0.152	1.43	0.00	0.019
Saudi Arabia	-10	14	0.028	1.93	0.00	0.021
North Korea	-10	14	0.092	1.08	0.00	0.044

Several observations can be done looking at the full table. To start, some considerations about each singular index will be made. After, a comparative analysis of all the indexes will be performed.

[61] EIU: The Economist Intelligence unit's democracy index
EDI: Effective democracy index
MLI: Machine Learning democracy index

I.4.3 Singular indexes analysis

The first index in the table is the Polity IV. As shown in the boxplot below, the full range, -10 (most autocratic) to 10 (most democratic), is present, so that, according to the results, there are some countries like North Korea or Saudi Arabia that are absolute autocracies and some other countries as Norway or Denmark that are perfect democracies.

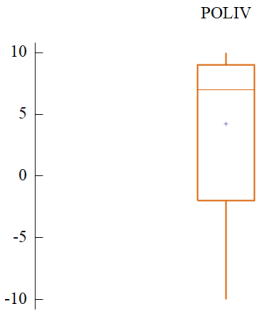


FIGURE I.3 POLITY IV BOXPLOT

The mean value of the distribution is 4.21 while the median is 7.0[62]. Considering both the median and the figure above is easy to see how the distribution of values tends to the higher end. This quite "optimistic view" is the result of a broad democracy definition, described by five sub-indexes, and the additive approach used to aggregate the results.

[62] More Polity IV statistics are available in Appendix A.

The second index reported in the third column of the table is the Freedom House democracy index. As for the previous index, also this one actually uses all range of values from 2 (most democratic) to 14 (most autocratic).

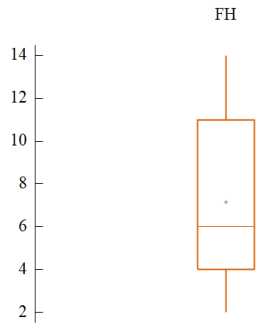


FIGURE I.4 FREEDOM HOUSE DEMOCRACY INDEX BOXPLOT

As shown in the boxplot above, the distribution is quite symmetrical even if a small movement towards more democratic values can be observed, with a mean value of 7.15 and a median value of 6.0[63]. The picture that emerges from this index and its distribution is a more "balance" view of the democracy status around the world. This result, partially different from the Polity IV overall results, is the consequence of a more maximalist democracy definition where an important part is played by civil liberties. Therefore, due to the aggregation method applied, to achieve more democratic values a country needs to guarantee both political rights and civil rights.

[63] More Freedom House democracy index statistics are available in Appendix A.

The third index reported in the table is the V-Dem's Polyarchy index. What emerges clearly in the table is that this index is, until now, the first not to encompass all range of values. The most autocratic country, Saudi Arabia, has a score of 0.028 while the most democratic country, Norway, has a score of 0.913. The absence of perfect scores implies that there are not perfect democracies or perfect autocracies in 2018 in the world. As shown in the boxplot below, the distribution of the index is almost centred toward the middle point, thanks to a mean value of 0.54 and a median value of 0.56[64].

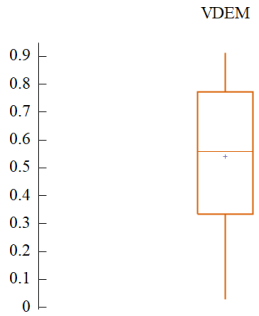


FIGURE I.5 V-DEM'S POLYARCHY INDEX BOXPLOT

These findings confirm the more realistic democratic concept used in the underlying creation process of this index. Moreover, the fact that not one single country achieves a perfect score, positive or negative, is evidence of the validity of the innovative aggregation method used to compute this index, that as written

[64] More V-Dem's Polyarchy index statistics are available in Appendix A.

before, allows Polyarchy to represent a more nuanced and precise picture of democracy.

The fourth index used in the table is The Intelligence Unit's democracy index. As for the previous index, also this index in 2018 does not encompass the entire range of scores. Of the entire prefixed range, 0 (most autocratic) to 10 (most democratic), the highest value registered is 9.87, Norway, while the lowest value is North Korea with 1.08. Regarding the distribution of the values, what emerge from the 2018 data is a tendency toward the middle point, supported by a mean value of 5.50 and a median value of 5.70[65]. Like all the previous indexes, even if in minor way, The Economist Intelligence Unit democracy index's distribution is shifted more toward the democratic values, as shown in the figure below.

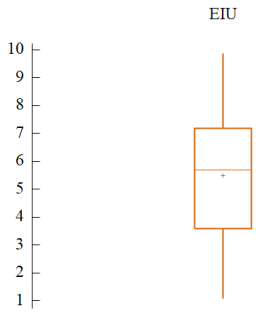


FIGURE I.6 THE ECONOMIST INTELLIGENCE UNIT'S DEMOCRACY INDEX

[65] More The Economist Intelligence Unit's democracy index statistics are available in Appendix A.

What emerges from all this, is an index that, taking into consideration also some important civil liberties, as explained before, shows a less enthusiastic picture of the democracy status in 2018 around the world.

The fifth index used in the table is the Effective Democracy Index. This index is very particular given the fact that, when it was introduced, no official database was developed, so that an interested researcher needs to construct the scores by himself, following the detailed instructions given by Alexander et al (2011)[66]. The author of this work has computed this index using for the democratic right index, data from Freedom House index while for the rule of law index, data from the Rule of Law index for 2018 of the World Bank's Worldwide Governance Indicator (WGI)[67].

From the 2018 scores, it emerges that all the prefixed range of values is used, from 0 (most autocratic) to 100 (most democratic). Due to its very particular aggregation method, only one country achieves the maximum score of 100, Finland[68], while ten countries are pictured as autocracies with the lowest score of 0. Also, the distribution of the values is influenced by these strict criteria: the

[66] ALEXANDER A. C., INGLEHART R., WELZEL C., *Measuring effective democracy: A defence*, International Political Science Review, 33(1), 2011, 41-62.
[67] Raw data and computations of the author to construct the Effective Democracy Index are disponible in Appendix B.
[68] Finland is the only country to score 1 in the rule of law index. For more information see Appendix B

mean value is 33.89 while the median value is 25.5[69]. This indicates a distribution that tends strongly towards the lowest values as shown in the figure below.

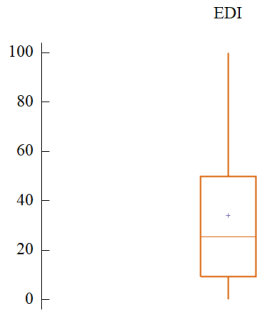


FIGURE I.7 EFFECTIVE DEMOCRACY INDEX BOXPLOT

The effective democracy index is the first to show a negative picture of the democracy status around the world in 2018. The cause of this is to be found in the extremely strict democracy concept used and in the consequent aggregation method applied.

The last index used in the table is the Machine Learning democracy index. Looking at the table is possible to note that there are no perfect scores, negative or positive, reported. The extreme cases are Suriname with 0.997, maximum example of democracy in 2018, and the United Arab Emirates with 0.00046, maximum example of autocracy, near the perfect autocracy score of 0. Observing the distribution what emerges is a strong concentration in the upper part of the

[69] More Effective democracy index statistics are available in Appendix A.

scale so that, while the mean value is 0.68, the median value reaches an impressive value of 0.87 [70]. To better understand the proportion of this distribution, below it is inserted a boxplot.

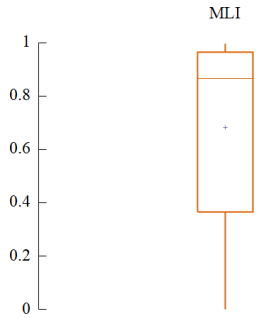


FIGURE I.8 MACHINE LEARNING DEMOCRACY INDEX

This very "generous" result is the result of the very minimalist democracy definition adopted to construct this index, less characteristics are observed, more probability there is that a country qualifies as democracy, at least in some degree.

I.4.4 Comparative score correlation analysis

After the individual analysis of each index, now a comparative and more general assessment is conducted to determine the possible similarities and differences between the selected indexes, and to establish the causes of these results.

To study the relationships between each index with the others, a correlation matrix is proposed[71].

[70] More Machine Learning democracy index statistics are available in Appendix A.

TABLE I.7 SCORE CORRELATION MATRIX[72]

POL IV	FH	V-DEM	EIU	EDI	MLI	
1	-0.8453	0.8613	0.8084	0.6885	0.9167	**POL IV**
	1	-0.9354	-0.947	-0.8991	-0.8566	**FH**
		1	0.8994	0.8575	0.8733	**V-DEM**
			1	0.9099	0.8038	**EIU**
				1	0.6788	**EDI**
					1	**MLI**

Observing this table, various aspects need to be discussed.

First, all the correlation coefficients linked to the Freedom House index are negative. Even if from the arithmetic point of view could seem that an inverse correlation would mean some problem or error, from the democratic index standpoint those results are to be expected. Therefore, the Freedom House index is the only indicator inside those selected to present a scale where more democratic the state is, more the score will be low (2 represent the extreme limit and the most democratic) while less democratic the state is, more the score will be high (14 as extreme limit and the most autocratic). All the other indexes, instead, present an increasing scale where more the state is democratic, more the valuation is high.

[71] The correlation matrix is computed with the help of the econometric software "Gretl".
[72] In appendix C, for the interested reader, is reported the graphic representation of this matrix.

Looking at the correlation matrix, what emerges is particularly good correlation between the indexes with most of the coefficients equal or greater than 0.85 in absolute value[73]. This means that, even if each index is based on slightly different democracy concept and it is computed with different aggregation method, these indexes tend to show the quite similar pictures.

Only few coefficients stand up with value below the 0.85 threshold[74]. Reading the table from left to right, the first to analyse is the correlation coefficient between Polity IV and The Economist Intelligence Unit's democracy index. With a value of 0.81 is only few decimal points from the minimum threshold so that both indexes produce still comparable results. The relative minor differences arise due to the different extension of the democracy concept underlying their theoretical foundations. Polity IV is based on a broad democracy definition while the EIU's democracy index is based on a maximalist definition where also some important civil liberties are considered. These liberties are likely to cause the differences observed in the scores of the two indexes.

Moving one cell to the right in the table, there is the most problematic correlation coefficient. With a value of 0.69, it is the lowest in the whole matrix. This coefficient describes the relatively small correlation between the Effective

[73] The absolute value has been added to encompass the Freedom House index given the fact that, as explained before, it presents all negative coefficients.
[74] The 0.85 value has been chosen subjectively by the author.

democracy index (EDI) and the Polity IV index. The main causes of this low score, according to the author of this work, are linked to the democracy concepts used and to the aggregation methods applied. Regarding the first aspect, as explained above, Polity IV is based on a broad definition of democracy while the Effective democracy index is based on an "effective democracy" concept where the role played by the rule of law component is quite important[75]. These essential differences in the theoretical background are reflected also in the aggregation methods applied to construct the indexes. While Polity IV uses a more traditional aggregative approach, the Effective democracy index uses an innovative conditioning approach where the scores of the democratic rights index (DRI) is multiplied by the conditioning factor, the rule of law index (RLI). Clearly the differences in the scores between Polity IV and EDI are to be imputed to this aspect. This conclusion is also supported by the fact that to compute the democratic rights index, used in EDI, the data are taken from the Freedom House index and then those are just converted in a 0-100 scale. As can be expected, the correlation between DRI and Polity IV, as for Freedom house index and Polity IV, is remarkably high with a correlation coefficient of 0.85[76]. So, if EDI would be constructed only by using its DRI sub-index, the correlation would be much higher. This is proof that the conditioning approach, obtained multiplying the DRI

[75] For a more detailed explanation of these concepts see paragraph "effective democracy index".
[76] The correlation table with DRI instead of FH is inserted in Appendix B.

with the conditioning factor RLI, is the main cause of the low correlation registered between EDI and Polity IV. One of the most significant discrepancies between the Polity IV score and the EDI score is the case of Italy.

TABLE I.8 ITALY EXAMPLE OF LOW CORRELATION BETWEEN POLITY IV AND EDI

COUNTRY	POL IV	DRI	RLI	EDI
Italy	10	100	0.5887	58.87

As shown in the table above, there is perfect correlation between Polity IV and the DRI index, while the overall score of EDI is quite different from the Polity IV score due to low score of the rule of law index.

Another score that does not reach the 0.85 threshold with its 0.80 value is the correlation index between the Machine Learning democracy index (MLI) and The Economist Intelligence Unit's democracy index. The absolute value of this relationship is nevertheless quite high, so that the differences in the measurements are not substantial. The existing discrepancies are to be imputed to the different underlying democracy concept used to create these indexes. The MLI is based on a very restrictive and minimalist democracy concept while the EIU's index is constructed with a maximalist democracy concept. As for the differences

observed with the Polity IV index, the main aspect responsible is the civil liberties introduced in the democracy definition.

The last correlation index that stands up for its lowest value (0.68) of the whole table, is the one that describe the relationship between the Machine Learning democracy index (MLI) and the Effective democracy index (EDI). The causes of this low level of correlation are to be found, as often reported in this last paragraph, in the democracy concept used and the consequent aggregation method. MLI is based on a very minimalistic democracy concept that better suits the Support Vector Machines used to develop and to perform the aggregation method. The effective democracy index, instead, is based on a quite broad democracy concept called "effective democracy", developed as explained before, into a conditioning approach where the rule of law, that in the minimalist democracy concept used in the MLI is not included, has a quite significant role. With these differences, according to the author, it is possible to account for all the differences in the valuations made by the two indexes. To better grasp those differences, it is sufficient to confront the boxplots of these two indexes reported in the pages above[77], where the indexes are analysed individually. The reader will note how the distribution of the Machine Learning democracy index tends to

[77] See figure 13 and figure 14.

remarkably high (democratic) values while the distribution of the effective democracy index tends towards values below the middle (more autocratic).

I.4.5 Comparative rank correlation analysis

To fully exhaust this comparative analysis, it can be helpful to adopt a new series of indexes to evaluate the level of correlation between the different democracy indexes through the analysis of the ranked distribution of the countries in the pool data. Those indexes are known as rank correlation indexes.

The first step in this particular investigation is the ranking of all countries from the most democratic, denominated as 1st, to the most autocratic country, denominated as 158th. Each democratic index presents its own individual ranking. Here is reported just the row of Italy as an example. The interested reader will find all the data in appendix C.

TABLE I.9 ITALY RANKING ACROSS DEMOCRACY INDEXES

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Italy	1	1	11	31	36	4

Important to note, is the fact that for both the Polity IV index and the Freedom House index, several countries present with the same rank. The cause of this

phenomenon is that both indexes employ quasi-continuous scales, with prefixed ranges, limiting the number of possible scores.

Once the adjustments for the rankings are done, it is possible to compute all rank correlation indexes between the different democracy indexes. The results are reported in the correlation matrix below.

TABLE I.10 RANK CORRELATION MATRIX

POL IV	FH	V-DEM	EIU	EDI	MLI	
1	0.8951	0.8737	0.8767	0.8588	0.8653	**POL IV**
	1	0.9347	0.9523	0.9669	0.8879	**FH**
		1	0.9099	0.9058	0.9052	**V-DEM**
			1	0.9566	0.8711	**EIU**
				1	0.8585	**EDI**
					1	**MLI**

What emerges from the matrix is that, based on rank correlation indexes, the correlation between the six democracy indexes is quite strong. All values are 0.85 or higher so that it is possible to note that overall, rank correlation is higher than correlation computed on scores.

To better understand and to further test the relationship between the democracy indexes, an ulterior step is taken. Each index, one by one, has been taken into consideration. The overall ranking obtained with the selected index is confronted

with all the other indexes' rankings to highlight the potential differences in rank of each country. This process is aimed at undercover eventual differences in the evaluation done by distinct democracy indexes.

As expected, some differences in the ranking emerge when each country is analysed. A major part of these differences is of minor entity and most likely derived by the different underlying democracy concept adopted by democracy indexes.

To uncover significant discrepancies the following process has been implemented. Once all differences have been computed, the results are filtered based on a discretionary limit of 30 positions[78] set by the author. In the following part will be reported and analysed only the situations where countries present differences from a particular index in ranking higher than 30 positions in all the other indexes[79].

TABLE I.11 TABLE OF RANKINGS OF SELECTED CASES

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Burkina Faso	86	82	46	100	81	92
Cabo Verde	1	1	41	24	33	74
Hungary	1	53	84	55	41	91
Israel	86	38	51	28	34	55
Japan	1	1	33	20	14	72

[78] The discretionary limit is set at 30 positions based on the discretionary choice done by the author.
[79] The comprehensive data of all countries is reported in appendix C.

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Kenya	33	89	98	95	87	81
Kyrgyzstan	52	107	88	95	116	83
Lithuania	1	1	35	34	26	69
Luxembourg	1	1	9	11	8	50
Myanmar	52	107	116	113	117	102
Netherlands	1	1	16	10	9	49
South Africa	33	38	49	38	50	82
Suriname	98	38	40	47	47	1
Suriname	98	38	40	47	47	1
Sweden	1	1	2	2	6	39
Switzerland	1	1	7	9	3	45
Timor-Leste	52	53	42	40	89	37
United Kingdom	52	1	8	13	12	10

After the complete evaluation of all data obtained, what emerges is that Polity IV presents seven relevant cases, Freedom House index has no relevant case where a country presents differences bigger than 30 positions for all the other five democracy indicators, V-Dem's democracy index has only one relevant case, the Economist Intelligence Unit's democracy index presents no relevant case, the effective democracy index only one relevant case, and the machine learning democracy index have nine relevant cases.

The index that presents the lower correlation scores in all the rank correlation matrix is Polity IV so that the first cases analysed below are obtained highlighting Polity IV and computing all the differences in ranking from this particular index.

TABLE I.12 DIFFERENCES IN RANKING FROM POLITY IV

COUNTRY	FH	V-DEM	EIU	EDI	MLI
Hungary	52	83	54	40	90
Israel	48	35	58	52	31
Kenya	56	65	62	54	48
Kyrgyzstan	55	36	43	64	31
Myanmar	55	64	61	65	50
Suriname	60	58	51	51	97
United Kingdom	51	44	39	40	42

Seven countries, as shown in the table above, present differences bigger than 30 position in all the other democracy indexes' rankings: Hungary, Israel, Kenya, Kyrgyzstan, Myanmar, Suriname, and United Kingdom.

Hungary thanks to the top score of 10 obtained in Polity IV is inserted in the first position, together with other 31 countries. The other indicators, instead, show lower scores resulting in lower ranks. Freedom House represents Hungary as a good democracy but not perfect, due to some limitations in both political rights (PR score is 28/40) and in civil liberties, especially due to limitations inflicted to minorities (CL score of 44/60)[80]. The Economist Intelligence Unit report similar findings. Hungary is pictured as "flawed democracy", principally due to low scores in the political environment. In detail, Hungary has a mediocre political

[80] https://freedomhouse.org/country/hungary/freedom-world/2018

participation, scored 5.0, while both functioning of government and political culture is just sufficient[81]. The indicator that shows the smallest difference in ranking is the Effective Democracy Index thanks to its method of computation. Indeed, being obtained as product between the conversion of the Freedom House index and the conversion of the World Bank's rule of low index, is positively influenced by the good evaluation of 0.66 of the rules of law. Bigger differences, instead, emerge in ranking when V-Dem's Polyarchy democracy index is considered. Being positioned, according to the V-dem's ranking, 84th in the world, Hungary presents an astonishing difference of 83 positions. With an overall evaluation of 0.536, Hungary is painted as a below the average democracy, especially due low valuations in both political regime and civil rights. In general agreement to the Freedom House evaluation, the lowest score in the sub-indexes used to compute the overall score, is the freedom of expression index with a valuation of 0.619. to better understand the proportion of this value, it is sufficient to consider that, if all countries evaluated by V-Dem institute would have been taken into account and ranked based on the score of this sub-index, Hungary would be the 128th country worldwide[82]. Finally, the biggest difference in position, is reported between Polity IV and Machine Learning Democracy

[81] ECONOMIST INTELLIGENCE UNIT, *Democracy index 2018: Me too? Political participation, protest and democracy*, 2019
[82] V-DEM INSTITUTE, *Democracy Facing Global Challenges V-Dem annual democracy report 2019*, University of Gothenburg, 2019.

indicator, with 90 positions. MLI, for Hungary, has produced similar results to the V-Dem indicator. Slightly worst results emerge due to the more minimalist democracy concept underlying. Analysing less aspects, the ones considered are more relevant, so that, the low score in freedom of opinion contributes to the lower overall score.

Israel presents a very different case. As shown in the table above, the differences reported are quite similar across all indicators. This means that while all indicators paint a similar picture, the only index that differs in Polity IV itself. Indeed, Israel is presented as good democracy with an average position approximately between the 30th and the 50th, due primarily to some concerns for minorities rights[83], while Polity IV ranks Israel 86th in the world. The main cause of this low score is to be found in the "Competitiveness of Political Participation" (PARCOMP). According to the publisher of this index, Israel presents a factional competitiveness. Moreover, the result is worsened by the "sectarian" aspect of the "Regulation of participation" (PARREG)[84]. Summing up, what appears to be the most relevant cause for the overall differences between Polity IV and all the other indexes, is the difficulties registered in guaranteeing political participation to all Israeli citizens.

[83] Freedom House Civil Liberties index scores 43/60 while the Economist Intelligence Unit evaluates Civil Liberties as 5.88/10.
[84]MARSHALL M. G., GURR T. R., *Polity5, Political regime characteristics and transitions, 1800-2018, Dataset user's manual*, Center for Systemic Peace, 2021.

The case of Kenya is, in some way, the opposite of the Israelian case. Across the table, it is possible to see how all indexes evaluate the Kenian democracy approximately at the same level, around between the 80th and the 90th position, while Polity IV ranks Kenya, along with other several countries, 33rd globally. Indeed, according to Polity IV, Kenya democracy level is quite high, with a score of 9, presenting only few minor problems in the "Competitiveness of political participation", being defined as "transitional" instead of perfectively "competitive"[85]. According to all the other indicators, instead, Kenya democracy level is lower due to problems in both political regime and civil liberties[86]. Most relevant is the political aspects, where political rights are evaluated badly by Freedom House (PR score is 19/40), clean election that according to V-Dem's clean election index is only 0.296[87], 135th globally, and electoral process and pluralism that the Economist intelligence Unit evaluate 3.50/10[88].

Kyrgyzstan follows the same path of Kenya. Polity IV evaluate the democracy level as quite high, with an overall score of 8, putting Kyrgyzstan 52nd globally. Some minor problems are reported, as for Kenya, in "Competitiveness of political

[85] MARSHALL M. G., GURR T. R., *Polity5, Political regime characteristics and transitions, 1800-2018, Dataset user's manual*, Center for Systemic Peace, 2021.
[86] Freedom House Civil Liberties is 29/60 while the Economist Intelligence Unit score for civil liberties is 4.41/10.
[87] V-DEM INSTITUTE, *Democracy Facing Global Challenges V-Dem annual democracy report 2019*, University of Gothenburg, 2019.
[88] ECONOMIST INTELLIGENCE UNIT, *Democracy index 2018: Me too? Political participation, protest and democracy*, 2019.

participation" and in "Openness of executive recruitment" (XROPEN)[89]. On the contrary, all the other indexes find some relevant problems in Kyrgyzstan's democracy. Starting from the low score of 10 by Freedom House due to very low levels of political rights (only 12/40) and civil liberties (only 25/60)[90]. The causes of these low scores, electoral process, and government environment together with violation of minorities right, low rule of law and low protection of individual rights, are, in different ways, cited in all democracy indexes. V-Dem's index is low influenced by both freedom of association sub-index, scored as 0.721 and clean elections sub-index, evaluated as 0.540[91]. The Economist Intelligence Unit finds very serious problems in the "functioning of government" and in "political culture", scoring respectively 2.93/10 and 4.38/10[92]. The biggest difference registered for Kyrgyzstan is between Polity IV and Effective democracy index, and astonishing difference of 64 positions. The main reason is the quite low World Bank's rule of law index, 0.32, used to compute the index together with the Freedom House index. Finally, the Machine learning indicator, also present an important difference in ranking, even if not as pronounced as that of the Effective democracy index due to the more minimalist approach used in the former. MLI,

[89] MARSHALL M. G., GURR T. R., *Polity5, Political regime characteristics and transitions, 1800-2018, Dataset user's manual*, Center for Systemic Peace, 2021.
[90] https://freedomhouse.org/country/kyrgyzstan/freedom-world/2018
[91] V-DEM INSTITUTE, *Democracy Facing Global Challenges V-Dem annual democracy report 2019*, University of Gothenburg, 2019.
[92] ECONOMIST INTELLIGENCE UNIT, *Democracy index 2018: Me too? Political participation, protest and democracy*, 2019.

focusing more on the political process and on freedom of expression, does not grasp all the important problems linked to the government environment, highlighted by other indexes.

Myanmar also follows the path of Kyrgyzstan and Kenya, in almost a specular way. the pattern emerges clearly looking at the table of the differences with Polity IV reported above. The quantitative values of the differences reported are almost identical, with astonishing resemblance between Kenya and Myanmar. Indeed, the Burmese democracy, with only some minor difficulties in "competitiveness of executive recruitment" and in "competitiveness of political participation", overall, according to Polity IV shows a very promising level of democracy, awarded with a total score of 8[93], and consequently the 52nd position on the ranking. Instead, Freedom House is very critic of the status of the democracy, due to low levels of political rights, only 13/40, and civil liberties, only 18/60, with an approximately null score on the rule of law section on top of open violations of human rights of minorities, so evident that Freedom House, in its calculation, has awarded a negative bonus of -4 points on the civil liberties section[94]. V-Dem finds almost the same results, with even lower score on the freedom of association and freedom of

[93] MARSHALL M. G., GURR T. R., *Polity5, Political regime characteristics and transitions, 1800-2018, Dataset user's manual*, Center for Systemic Peace, 2021.
[94] https://freedomhouse.org/country/myanmar/freedom-world/2018

expression sub-indexes, 0.543 and 0.568 respectively [95]. The Economist Intelligence Unit agrees with these evaluations, awarding an average of 3/10 on all the sub-indexes used in its calculations [96]. The amplest difference is again registered with the effective democracy index due to the extremely low score of the World Bank's rule of law index. As before, MLI is slightly more optimistic due to the absence of several aspects where Myanmar performs really bad, even if the overall judgement remains quite negative.

One row below Myanmar, in the table is reported a very interesting case: Suriname. This small south America state, independent from Holland only since 1975, is ranked 1st according to the MLI while according to the Politi IV index is ranked 98th. The other indicators are positioned in the middle, with a tendency upwards, ranking Suriname approximately around the 40th position. According to MLI, Suriname has the best democracy worldwide when only political participation, political competition, and freedom of opinion are considered. At the opposite side, according to Polity IV, Suriname democracy is only relatively good, with an overall score of 5. The executive recruitment is flowed both in competitiveness and in openness, substantial limitations are reported in constraint of chief executive while good competitiveness of political participation is

[95] V-DEM INSTITUTE, *Democracy Facing Global Challenges V-Dem annual democracy report 2019*, University of Gothenburg, 2019.
[96] ECONOMIST INTELLIGENCE UNIT, *Democracy index 2018: Me too? Political participation, protest and democracy*, 2019.

observed. Moreover, a negative aspect of autocracy is inserted, defining the regulation of political participation as "sectarian"[97]. Freedom House with its index paints a more positive image, with good political rights, 34/40, and good civil liberties, 44/60[98]. The most difficult aspect reported is the role of law component. This component reflects also, as always, on the EDI evaluation and ranking, even if only by few positions. The Economist Intelligence Unit makes almost identical general evaluation of the country, ranking Suriname at the same exact position of EDI, 47th. V-Dem even if with an overall good judgement, it is the only publisher to uncover some minor problems in the freedom of expression sub-index. Nevertheless, in general agreement with the other indexes, in V-Dem's ranking, Suriname is positioned 40th.

The last country inserted in this list is United Kingdom. This is a particular case because for all indexes, excluded Politi IV, the country is positioned, as one of the leading and long-lasting democracy of the world, in the top 13. The only exception, that is also the cause for UK to be inserted on this list, is the score of 8 produced by Polity IV index. As explained before, at the beginning of this paragraph, due to the quasi-continuous scale of the index, several countries cover the same position, so that UK that has a good overall score (8 out of 10) is

[97] MARSHALL M. G., GURR T. R., *Polity5, Political regime characteristics and transitions, 1800-2018, Dataset user's manual*, Center for Systemic Peace, 2021.
[98] https://freedomhouse.org/country/suriname/freedom-world/2018

nevertheless listed as 52nd. The reason of this good but not perfect score is to be found in the "competitiveness of political participation" sub-index, awarded with the lowest possible score, being defined as "factional"[99].

Having exhausted all the relevant cases of Polity IV and given that no relevant case has been highlighted for the Freedom House index, the next case to be analysed is Burkina Faso, which presents all differences from the V-Dem's democracy index, higher than the 30 thresholds, as reported in the table below.

TABLE I.13 DIFFERENCES IN RANKING FROM V-DEM

COUNTRY	POL IV	FH	EIU	EDI	MLI
Burkina Faso	40	36	54	35	46

What emerges in this case is the fact that the V-Dem's democracy index represents the democratic level of Burkina Faso as quite good, with a score of 0.739, valid for the 46th position worldwide. Particularly relevant is the high score in the freedom of expression index, 0.886, and in clean election index, 0.795[100]. On the opposite side, all the other indicators portrait a more modest picture, with only small differences between the five, expressed by the fact that Burkina Faso is

[99] MARSHALL M. G., GURR T. R., *Polity5, Political regime characteristics and transitions, 1800-2018, Dataset user's manual*, Center for Systemic Peace, 2021.
[100] V-DEM INSTITUTE, *Democracy Facing Global Challenges V-Dem annual democracy report 2019*, University of Gothenburg, 2019.

ranked by all in positions between the 80th and the 100th. Freedom House, Polity IV, and effective democracy index, all place the country around the 80th position. The main reasons for these evaluations are some difficulties in both political regime and civil liberties. For the former, it is defined by Polity IV as "transitional" in both "competitiveness of executive recruitment" and "Competitiveness of Political Participation" and "sectarian" in "regulation of participation"[101]. Freedom House recognises 23/40 score[102] in political rights while the Economist Intelligence unit the functioning of government shows several problems, being evaluated by the relevant sub-index only 4.29[103]. regarding the civil liberties, Freedom House estimate a score of 37/60[104] while the Economist Intelligence Unit a score of 5.00[105]. Finally, the MLI score, and ranking are in line with all the other indicators.

Another singular relevant case is highlighted when considering the effective democracy index and with it computing all the differences in ranking with all the other indicators.

[101] MARSHALL M. G., GURR T. R., *Polity5, Political regime characteristics and transitions, 1800-2018, Dataset user's manual*, Center for Systemic Peace, 2021.
[102] https://freedomhouse.org/country/burkina-faso/freedom-world/2018
[103] ECONOMIST INTELLIGENCE UNIT, *Democracy index 2018: Me too? Political participation, protest and democracy*, 2019.
[104] https://freedomhouse.org/country/burkina-faso/freedom-world/2018
[105] ECONOMIST INTELLIGENCE UNIT, *Democracy index 2018: Me too? Political participation, protest and democracy*, 2019.

TABLE I.14 DIFFERENCES IN RANKING FROM EDI

COUNTRY	POL IV	FH	V-DEM	EIU	MLI
Timor-Leste	37	36	47	49	52

The relevant case for EDI is Timor-Leste, a very small south-east Asian country. What emerges from the table is the fact that all indicators, excluding the effective democracy index, have approximately the same evaluation of the democracy level of the country, as shown by the similar rankings reported above. The quality of democracy is good, with some problems linked to the electoral environment and some civil liberties. In details, according to the Economist Intelligence Unit the political participation il low with a score of only 5.56[106], and, according to Polity IV the "regulation of participation" is "sectarian"[107]. Regarding the civil liberties, Freedom House estimates a score of 37/60[108], dictated especially from a low rule of law, while according to V-Dem freedom of association sub-index with a score of 0.830 is only the 78th worldwide[109]. The MLI, influenced by some restrictions in political participation, produces a similar yet slightly less optimistic result. Timor-Leste emerges as a relevant case due to the very score of EDI. The main

[106] ECONOMIST INTELLIGENCE UNIT, *Democracy index 2018: Me too? Political participation, protest and democracy*, 2019.
[107] MARSHALL M. G., GURR T. R., *Polity5, Political regime characteristics and transitions, 1800-2018, Dataset user's manual*, Center for Systemic Peace, 2021.
[108] https://freedomhouse.org/country/timor-leste/freedom-world/2018
[109] V-DEM INSTITUTE, *Democracy Facing Global Challenges V-Dem annual democracy report 2019*, University of Gothenburg, 2019.

reason for these relevant differences is the World Bank's rule of law index used to compute the effective democracy index. For this particular country, the value of this index is quite low, around 0.27, so that the consequent democracy index is quite lower than all the others, awarding a ranking that is lower for about 40 positions than all the other indicators.

To conclude this part of the analysis, one last indicator must be highlighted and analysed in all the differences with the other indexes, the machine learning democracy index. As written before nine relevant cases emerge as shown in the table below.

TABLE I.15 DIFFERENCES IN RANKING FROM MLI

COUNTRY	POL IV	FH	V-DEM	EIU	EDI
Cabo Verde	73	73	33	50	41
Japan	71	71	39	52	58
Lithuania	68	68	34	35	43
Luxembourg	49	49	41	39	42
Netherlands	48	48	33	39	40
South Africa	49	44	33	44	32
Suriname	97	37	39	46	46
Sweden	38	38	37	37	33
Switzerland	44	44	38	36	42

Several aspects need to be considered when analysing the content of this table. First, the Suriname case has been already discussed, in the paragraph analysing the differences of Politi IV.

Another important trait to be considered is the continuous scale adopted by the machine learning democracy index. The consequences of this choice are two: no country has the same score, so each country has its own ranking, and countries with very similar democracy level can be positioned quite distant from each other, based on differences of decimal points. In particular, this is the situation of four countries reported in the table above. Luxembourg, Netherlands, Sweden, and Switzerland are some of the most advanced western democracies, as shown by all the other democracy indicators[110], but are ranked between the 39th and the 50th position in the MLI ranking due to less than 0.04 differences with the first of the list, Suriname.

Four countries remain to be discussed: Cabo Verde, Japan, Lithuania, and South Africa.

Cabo Verde, presents substantial differences in both Polity IV and Freedom House index, being ranked 1st in both whiles being ranked 74th by the MLI. The

[110] For all the democracy indicators, excluded MLI, these four countries are positioned in the top 10 globally. The only small exception is Netherland that according to V-Dem's index is ranked 16th. The cause of this ranking is a value in the freedom of association index only good and not optimum.

main cause is to be found in the different interpretation and valuation of political participation aspect. For both Polity IV and Freedom House, the political environment of the country is optimal while MLI highlights some minor difficulties[111]. Those problems, or some aspects of them, are highlighted also by the other indicators. For the Economist Intelligence Unit, the political participation, and the political culture, are the weakest parts of Cabo Verde's democracy, with scores of only 6.67 and 6.88[112]. The World Bank's rule of law, which influences that EDI's score, is slightly low, 0.44, lowering the optimal score of the Freedom House index, ranking the country in the EDI's column only 33rd. Finally, V-Dem with its average score on freedom of expression, 0.859 or 54th globally[113], is the index that positions Cabo Verde nearer to the MLI's ranking.

Japan, as the previous country, shows optimal valuations in both Polity IV and Freedom house index, while some small issues arise in the other indicators. According to V-Dem, the country has less than optimal freedom of expression, 0.868, ranking Japan 33rd globally. The Economist Intelligence Unit is more generous, positioning the country at the 20th place, citing only minor problems on

[111] The overall MLI score of the country is positive, being less than 0.1 lower than Suriname, the top of the list.
[112] ECONOMIST INTELLIGENCE UNIT, *Democracy index 2018: Me too? Political participation, protest and democracy*, 2019.
[113] V-DEM INSTITUTE, *Democracy Facing Global Challenges V-Dem annual democracy report 2019*, University of Gothenburg, 2019.

political participation[114]. Finally, due to quite high World Bank's rule of law, 1.534, is positioned 20th worldwide according to the EDI ranking. On the contrary, according to MLI Japan is positioned 72nd worldwide, primarily due to problems already cited in political participation, that in the method of computation of the machine learning democracy index, carry more weight, influencing the overall score.

Lithuania presents a very similar situation of Japan, with all the differences almost identical and results from MLI distant only 3 positions. Both Polity IV and Freedom House index are optimal, V-Dem's democracy index is quite similar, with only two positions of differences from Japan[115]. Nevertheless, the only issue in the V-Dem indicator is the not optimal score on freedom of association index, only 0.859 or 56th globally. According to the Economist Intelligence Unit, some issues arise, instead in the political environment. Functioning of government is evaluated as 6.43, political participation as 6.11 while political culture as 6.25[116]. Finally, the overall score of EDI is worth the 26th position, due to a World Bank's rule of law index of 0.905. As for Japan the ranking in MLI is quite lower, 69th

[114] The value of the political participation index is 6.67. ECONOMIST INTELLIGENCE UNIT, *Democracy index 2018: Me too? Political participation, protest and democracy*, 2019.
[115] Japan has a V-Dem score of 0.808 while Lithuania has a score of 0.803. V-DEM INSTITUTE, *Democracy Facing Global Challenges V-Dem annual democracy report 2019*, University of Gothenburg, 2019.
[116] ECONOMIST INTELLIGENCE UNIT, *Democracy index 2018: Me too? Political participation, protest and democracy*, 2019.

worldwide, due to both the scale applied to the MLI index and to the important weight of political participation in the computation of the index[117].

The last country to be analysed, where differences emerge in all democracy indexes is South Africa. Together with Suriname, this country is the only on the list without a perfect score in Polity IV or Freedom House. Indeed, according to Polity IV, the democracy level of South Africa is good, with a score of 9 but not perfect. The cause of this, is the "competitiveness of political participation" index that is valuated as "transitional"[118]. Freedom House, in agreement with the previous index, describe the democracy level as good, scoring 4. The reasons behind this evaluation are some issues with the government environment, reflected in political rights scored 32/40, and small difficulties in rule of law application and protection of individual rights, awarding a score of 46/60 in civil liberties[119]. A different angle is described in V-Dem, where the clean election index is only the 60th worldwide, score 0.786. and freedom of expression index, in agreement with Freedom House, is 60th globally with a score of 0.786[120]. The Economist Intelligence Unit, instead, while awarding approximately the same position, slightly higher, find that the more important issue to be addressed in the

[117] Just to put things in prospective the quantitative difference between the MLI score of Japan and the MLI score of Lithuania is less than 0.04, sufficient for dividing the countries by 3 positions.
[118] MARSHALL M. G., GURR T. R., *Polity5, Political regime characteristics and transitions, 1800-2018, Dataset user's manual*, Center for Systemic Peace, 2021.
[119] https://freedomhouse.org/country/south-africa/freedom-world/2018
[120] V-DEM INSTITUTE, *Democracy Facing Global Challenges V-Dem annual democracy report 2019*, University of Gothenburg, 2019.

South African democracy is the quality of political culture, evaluated only as 5.00[121]. Finally, in agreement to Freedom House prevision of relatively low rule of law, the EDI indicator is influence by a low World Bank's rule of law index, score of -0.102. The MLI, as for all the other countries treated in the last part, ranks South Africa in lower position, 82nd worldwide, due to the difficulties in political participation.

I.4.6 Conclusive remarks on comparative analysis

Summing up, looking at both the score correlation indexes, and the rank correlation indexes, the six indexes here reported have the tendency to "agree" with each other's valuations. As highlighted, especially in the last part of this chapter, it is possible that in some particular cases, disagreement may emerge between them. The main causes of this differences are to be found in the different underlying concepts of democracy, and in how data is obtained and successively evaluated to compute the final score.

To not be misled and at the same time to be informed, it is essential to consider these possible differences, using when single countries or cases are evaluated, more than one democracy index. Only through the comparison of more indicator,

[121] ECONOMIST INTELLIGENCE UNIT, *Democracy index 2018: Me too? Political participation, protest and democracy*, 2019.

it is possible to have a real knowledge of the topic and one has the possibility to uncover any possible facets.

Especially for researchers and all people that have the duty to make decisions based on data described by these indexes, it is fundamental to consider, as explained before, that each index has its own peculiarities and its merits, so that it is imperative to have a detailed knowledge of all the major indicators in order to make an informed decisions in choosing the more appropriate indicators[122].

To conclude this chapter, one last topic must be discussed: the potential creation and adoption of some sort of "super-index" that in some way would make it easier for every part interested to measure and discuss democracy.

In the existing literature the most relevant case of "super-index" is the Unified Democracy Score (UDS) created by Pemstein et al. (2010)[123]. This continuous indicator has been created with the goal of painting a more general picture of levels of democracy around the world, producing an overall score, without the need to do any comparative analysis, or evaluating several different indexes. From a methodology standpoint, it has been created out of ten already existing

[122] The author hopes that in this chapter an interested researcher finds all the necessary information to do so.
[123] PEMSTEIN, D., MESERVE, S.A., MELTON, J., *Democratic compromise: A latent variable analysis of ten measures of regime type*, Political Analysis, 18 (4), 2010, 426–449.

democracy indicators[124], using a Bayesian latent variable approach. Nevertheless, several critiques have been moved to this indicator due to both methodological and theoretical issues. For the former, the Bayesian latent variable approach applied in the construction of the index creates concerns in the scores produced. It has been shown that this method is responsible to assign implausibly high or low values at the extremes of the democracy spectrum, systematically biasing regressions developed on this index[125]. From the theoretical point of view, the issues arising are not less severe. First, using indexes which coverages differ, creates spurious changes in the overall score, when the number of indicators at disposal changes. More importantly, uniting and mixing ten different indexes, with distinct underlying concepts of democracy and with quite diverse methods of computation, leads to conceptual inconsistencies. To combine an indicator based on a minimalist approach to democracy, with one based on a more maximalist approach results automatically in confusion and quite certainly to the loss of precious information. Because of all these critiques, the UDS index has seldom been used in any scientific paper or any econometrical study.

[124] While some of these indicators are hardly used anymore, some are quite popular and used indicators still pretty much in use, as the Freedom House indicator, and Polity IV.
[125] GRÜNDLER K., KRIEGER T., *Should we care (more) about data aggregation? Evidence from the democracy-growth-nexus*. CESifo Working Paper No. 74800, 2020.

Given the great advantages and opportunities that could emerge from the creation of a solid and good “super-index”, the author hopes that in the future more research will be conduct on this topic.

Having described in details the most commonly used democracy indexes, together with a detailed analysis of the correlation between them, both in terms of scores produced and in terms of ranking developed on these scores, the reader has now all the necessary knowledge to better understand the relationship between democracy and economic development, discussed at length in the following chapters.

II. DEMOCRACY AND ECONOMIC DEVELOPMENT

In this chapter, the relationship between democracy and the economic context will be discussed. It will be analysed how and if democracy promotes growth and economic development both in the short and in the long run.

The extremely complex and debated nature of this topic has contributed to the development of an extensive scientific literature. Both qualitative and quantitative studies have been conducted on the matter. To fully appreciate the magnitude of this phenomenon just consider that Colagrossi et al (2020)[126] to conduct their meta-analysis to analyse the democracy-economy link were able to extract data, from 1983 onward, from more than 180 studies, where 2000 econometric models were reported.

II.1 THEORETICAL BACKGROUND

The democracy-economy nexus, especially regarding the effects of democracy on economic growth, can be summarised by three hypotheses: the "conflict" hypothesis, the "compatibility" hypothesis, and the "sceptical" hypothesis[127]. The "conflict" hypothesis proposes the incompatibility between democracy and

[126] COLAGROSSI M., ROSSIGNOLI D., MAGGIONI M. A., *Does democracy cause growth? A meta-analysis (of 2000 regressions)*, European Journal of Political Economy, 61, 2020.
[127] This nomenclature has been introduced for the first time in SIROWY, L., INKELES, A*., The effects of democracy on economic growth and inequality: a review*, Studies in Comparative International Development, 25, 1990, 126–157.

economic growth. From a theoretical standpoint, the reasons behind this incompatibility idea are centred around the myopic and short-term oriented decisions taken by the elected officials to maximise the electoral success. This hypothesis has been developed since the 70s and it has reached its maximum appreciation during the last decade of the previous century, partially thanks to the remarkable economic success of some east Asian countries. Nowadays, in the literature this incompatibility approach has lost most of its strength. The "compatibility" hypothesis proposes that democracy, and in the larger sense the institutions, is essential for economic growth. This idea is based on two distinct pillars. First, following the "institutional" view for economic development[128], propriety rights that are essential for economic development are utterly secured only when both political and civil rights are guaranteed, and those are guaranteed only in a democratic context. Moreover, through the democratic system of checks and balances, stability is easier to experience and rent seeking policies are more difficult to implement. Nowadays, in the literature, also thanks to more developed econometric methods that have allowed researchers to conduct more in dept and more comprehensive studies, this compatibility idea has found increasing support. Finally, the "sceptical" hypothesis proposes that no systematic relationship exists between democracy and economic growth. The primary idea behind is that for

[128] One of the most important sources on this topic is NORTH D., *The paradox of the West*, Working paper, Washington University, St. Louis, 1990.

economic development all that matters are the policies that are been implemented while the type of regime is not relevant. This approach has been present in the literature with constancy.

The democracy-economic context nexus can also be analysed in the other direction, from the economic growth to the development of democracy. In literature this link has found less space than the one described above. Nevertheless, one hypothesis is worth to be mentioned, being the baseline for all the studies conducted on this link: the "Lipset" hypothesis or "modernization" theory [129]. According to this idea, in the long run real GDP Granger causes democracy and a GDP increase results in an improvement in democracy. Even if this theory has been formulated for the first time in 1959, only in recent years has been the centre of an intense scientific debate, thanks to the development of innovative econometric methods that have allowed researchers to better investigate this phenomenon. Opposed to this view, there is the so called "critical juncture hypothesis" that proposes the development of both democratic regime and economic context is contingent to specific historic events and it is caused by underlying changes in institutional arrangements.

[129] LIPSET, S.M., *Some social requisites for democracy: economic development and political* legitimacy, American Political Science Review, 53, 1959, 69–105.

II.2 DIFFERENT APPROACHES TO THE DEMOCRARY-ECONOMY NEXUS

In literature the effects of democracy on economic development have been treated in several distinct ways.

The first distinction is reflected in two major approaches that need to be reported. In the first approach democracy is inserted directly in the econometric models to practically measure its effect on the economy, while in the second approach the effects of democracy on economic development are measured through the various channels selected. This second way is based on the theory that democracy can influence indirectly the economy through a series of channels, particular aspects thought to be essential for development.

Another fundamental approach used to study this democracy-economy nexus is to analyse the effects of democracy on the economy over time. Some studies, thanks to new databases on democracy and economy[130], have conducted econometric analysis on exceptionally long time series, covering up to a century and more. Some other studies have preferred to focus on selected periods of time or on shorter timespans.

[130] The most important database on comparative economic growth and income levels over the very long run, often cited in literature, is the *Maddison Project Database* cured by the Groningen Growth and Development Centre. It covers 169 countries for extremely long period of time, some countries have data from the 1 A.D.. The database is frequently updated.

As for the time differentiation, studies have been conducted with different focuses regarding the spatial and geographical covering. Some, trying to identify a worldwide effect, have developed models taking into consideration the most extensive pool of countries possible. Others, on the other hand, to better describe regional effects, have chosen to use a more limited pool of countries.

Finally, several studies have been conducted on how the process of democratization may affect the economic context. This type of investigations is quite different from the others described above. They focus on how the transition of a country from an autocratic regime into a democracy may affect growth and development. Here democracy is presented as an evolving system while, in most of the literature, democracy is painted, at least in the models developed in the researchers, as a statical entity.

To conclude, it is worth to mention the existence of studies based on the meta-analysis technique. With this method, even if with all the limitations and precautions of the case, it is possible to have a glimpse on the general findings of all the literature on the topic. Only two of these studies have been conducted in the last twenty years[131]. The second, conducted in 2020 by Italian researchers, is

[131] DOUCOULIAGOS, H., ULUBAOLU, M.A., *Democracy and economic growth: a meta-analysis*, American Journal of Political Science, 52, 2008, 61–83.
COLAGROSSI M., ROSSIGNOLI D., MAGGIONI M. A., *Does democracy cause growth? A meta-analysis (of 2000 regressions)*, European Journal of Political Economy, 61, 2020.

extremely helpful for this thesis, so that the discussion on the empirical results reported below will start from this one.

II.3 **EMPIRICAL RESULTS**

II.3.1 General picture

Before entering in detail in all the possible angles to treat the democracy-economy nexus, it can be useful to analyse with a broader angle what emerges when most of the existing literature on the topic is considered. As explained before, with the meta-analysis technique it is possible to get a sense of the direction of the literature on the topic. Colagrossi et al. (2020) have analysed 188 studies and the 2047 models contained in them, covering more than 30 years of research. Analysing the data from a descriptive standpoint what emerges is that during the years most of the studies (53%) has failed to detect a significant effect of democracy on economic growth, as shown in the table and figure below.

TABLE II.1 SUMMARY TABLE OF DESCRIPTIVE STATISTICS ON STUDIES ANALYSED[132]

		Positive	Negative	Non-significant	Total
Democracy	effect sizes	711	242	1094	2047
		34.73%	11.82%	53.44%	
	studies	48	20	120	188
		25.53%	10.64%	63.83%	

[132] Figure taken from COLAGROSSI M., ROSSIGNOLI D., MAGGIONI M. A., *Does democracy cause growth? A meta-analysis (of 2000 regressions)*, European Journal of Political Economy, 61, 2020.

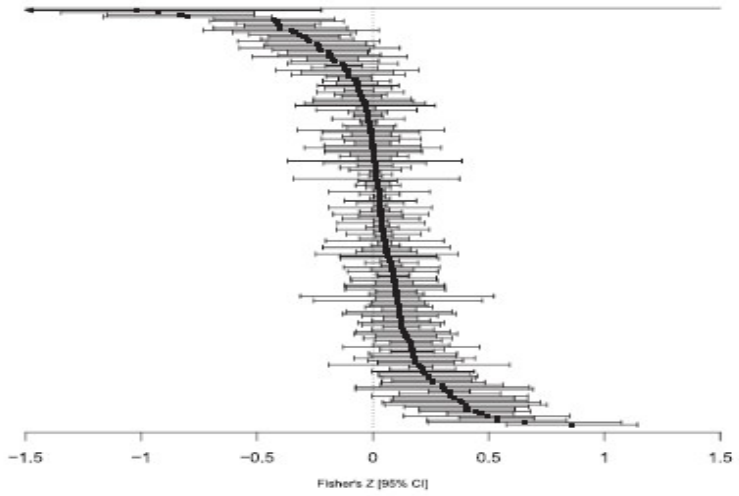


FIGURE II.1 FOREST PLOTS: AVERAGE EFFECT SIZE (FISHER'S Z) PER STUDY AND 95% CONFIDENCE INTERVAL[133]

Looking at both tails of the forest plot, even if the majority is concentrated on the zero-effect size, the positive effect size is almost double the negative effect size. Also in the table, the same result emerges.

Conducting the meta-analysis on the effects reported above, what the authors show is a positive yet small overall effect of democracy on economic growth. Quantitative speaking, the direct effect is measured around 0.04 where the estimation of the value changes a little according to the econometrical tool used to estimate it. It is also interesting to see how, during time, the effect estimated changes.

[133] Figure taken from COLAGROSSI M., ROSSIGNOLI D., MAGGIONI M. A., *Does democracy cause growth? A meta-analysis (of 2000 regressions)*, European Journal of Political Economy, 61, 2020.

TABLE II.2 COMPARISON BEFORE AND AFTER DECEMBER 2005[134]

	Pre-DU	Post-DU
	FE (clustered s.e.)	FE (clustered s.e.)
Democracy	0.0287	0.0343***
	(0.0202)	(0.0042)
Studies	94	94
Eff. Sizes	741	1306

In the table the two sub-samples are nominated Pre-DU and Post-DU in reference to Doucouliagos and Ulubaolu[135](2008). As explained before, this article is the first of this type to be published and it contains data up to December 2005. Colagrossi et al. representing themselves as the descendants of the first duo of authors. have chosen this data to show the evolution of the evaluation of the democracy effect on growth.

Looking at the table it can be noted that in the most recent literature the democracy effect on economic growth has been estimated higher than before and in an incredibly significant way[136]. A cause for this result is the evolution of the econometrical methods together with, as explained before, more accurate data

[134] Table taken from COLAGROSSI M., ROSSIGNOLI D., MAGGIONI M. A., *Does democracy cause growth? A meta-analysis (of 2000 regressions)*, European Journal of Political Economy, 61, 2020.
[135] DOUCOULIAGOS, H., ULUBAOLU, M.A., *Democracy and economic growth: a meta-analysis*, American Journal of Political Science, 52, 61–83, 2008
[136] The significance level of the estimation is 0.001

from extensive and adjourned databases[137] has allowed researcher all around the world to construct ever more accurate models.

Going deeper into the data clearly emerges that time and space are essential characteristics to be considered. The democracy effect is reported to vary a lot between the regions of the world. In this study's analysis Sub-Saharan Africa and high-income country are the regions where the effect is estimated stronger while in South Asia the effect is estimated negative[138]. In addition to space, also time matters. Observing the time span covered by a selected study can help predict the result reported. For instance, according to Colagrossi et al. studies that are focused on the 1960s, 1970s, and 2000s are more likely to observe a negative relationship[139].

II.3.2 Democracy effect over time

One of the most considered aspects when analysing the democracy-economy nexus is how the democracy effects influences the economy over time. Some try to describe the short run effects, others the long run effects, even if in literature studies where both the short and the long run have been analysed together are not rare.

[137] See note 130.
[138] All estimates are reported in Appendix D
[139] All estimates are reported in Appendix D

Likely the longest timespan covered inside a paper to analyse the long run effects is 500 years. In *Does democracy drive income in the world, 1500-2000?* Madesen et al.[140] have created an econometric model to understand the exceptionally long run of democracy. They have chosen to start this regression in 1500 since around that time, the income per capita estimated around the world would be quite similar, with low standard of living near subsistence diffused worldwide.

[140] MADSEN J. B., RASCHKY P. A., SKALI A., *Does democracy drive income in the world, 1500-2000?*, European Economic Review, 78, 2015, 175-195.

TABLE II.3 LONG TERM 1500-2000 REGRESSION[141]

Dependent var.	$\Delta ln(y)$			
	(1)	(2)	(3)	(4)
ΔDem	1.820***	1.239***	0.811***	0.470***
	(0.367)	(0.265)	(0.167)	(0.107)
Univ		0.246***		0.051
		(0.074)		(0.030)
Lit_{1900}			0.025***	0.022***
			(0.004)	(0.003)
Exec				0.407
				(0.251)
Inde				−0.383
				(0.256)
Cath				−0.254
				(0.183)
Musl				0.052
				(0.394)
Prot				−0.404
				(0.557)
Constant	0.727**	0.706***	0.867***	8.274*
	(0.272)	(0.213)	(0.179)	(4.745)
Sample	World	World	World	World
R-squared	0.258	0.411	0.543	0.621
Countries	99	99	96	93

As shown in the table above, after having considered religion [142] and human capital [143] in form of literacy and university attending, they have produced estimated value for the democracy effect on growth of 0.47. Practically, according to this model, a country that transform its political regime into a democracy, in the long run can expect its income to growth by 47%. Another way to interpret this

[141] Figure taken from MADSEN J. B., RASCHKY P. A., SKALI A., *Does democracy drive income in the world, 1500-2000?*, European Economic Review, 78, 175-195, 2015.
[142] Religions around the world, before the development of the modern state, have played an essential role in the economic performance and development of every region.
[143] Human capital is generally recognised as one of the most important factors for economic development.

number is that a standard deviation increase of democracy is associated with an increase of income of 0.14. With a coefficient of 0.47, it was found that around 8% of the total increase of income in the 1500-2000 period can be explained by democracy and phenomenon of democratization.

After having established that democracy in the exceptionally long run fosters economic development, it is time to understand what happens in a shorter version of the long run because as John Maynard Keynes once said, "*in the long run we will all be dead"*.

One of the most influential work on this topic is *Democracy does cause growth* by Acemoglu and al[144]. The main finding of this study, as explained by the title, is that democracy does cause growth in the long run. The definition of long run here is around 25 years or more from the last episode of democratization. One important thing to be considered is that to measure the effect of democracy on time, when time is a prefixed number of years, the concept on democratization rather than democracy is now quite relevant. So that in this article as well in biggest part of the literature what mostly has been studied, directly or indirectly, is how a country economy changes after the transition to a democratic regime. The authors themselves recognise this aspect in a note "*With some abuse of*

[144] ACEMOGLU D., NAIDU S., RESTREPO P., ROBINSON J. A., *Democracy does cause growth*, Journal of Political economy, 127, 2019, 47-100.

terminology, we sometimes describe this as "the impact of democracy in economic growth" (rather than the impact of democratization on economic growth)"[145].

Albeit this article is long and incredibly detailed so that it will be cited several times during the entire course of this chapter, the main finding, as anticipated before, is that democracy does cause growth. This statement is supported by their econometric models[146] constructed using data of 175 countries from 1960 to 2010[147].

[145] ACEMOGLU D., NAIDU S., RESTREPO P., ROBINSON J. A., *Democracy does cause growth*, Journal of Political economy, 127, 2019, 47-100. Citation taken from page 48.
[146] The preferred models of the authors are obtained using dynamic (linear) panel model for GDP. In particular a full dynamic model and two GMM models for GDP are used in the main tables of results.
[147] It is important to note that the sample is not balanced, which means that the data for each country is not the same in quantity for all the countries.

TABLE II.4 EFFECT OF DEMOCRACY ON LOG GDP PER CAPITA[148]

	Within Estimates				Arellano and Bond Estimates				HHK Estimates			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Democracy	.973	.651	.787	.887	.959	.797	.875	.659	.781	.582	1.178	1.682
	(.294)	(.248)	(.226)	(.245)	(.477)	(.417)	(.374)	(.378)	(.455)	(.387)	(.370)	(.352)
Log GDP, firs. lag	.973	1.266	1.238	1.233	.946	1.216	1.204	1.204	.938	1.158	1.150	1.155
	(.006)	(.038)	(.038)	(.039)	(.009)	(.041)	(.041)	(.038)	(.011)	(.038)	(.040)	(.036)
Log GDP, second lag		−.300	−.207	−.214		−.270	−.193	−.205		−.217	−.127	−.122
		(.037)	(.046)	(.043)		(.038)	(.045)	(.042)		(.035)	(.050)	(.041)
Log GDP, third lag			−.026	−.021			−.028	−.020			−.030	−.040
			(.028)	(.028)			(.028)	(.027)			(.026)	(.024)
Log GDP, fourth lag			−.043	−.039			−.036	−.038			−.039	−.028
			(.017)	(.034)			(.020)	(.033)			(.015)	(.026)
p-value, lags 5–8				.565				.478				.094
Long-run effect of democracy	35.587	19.599	21.240	22.068	17.608	14.882	16.448	11.810	12.644	9.929	25.032	35.104
	(13.998)	(8.595)	(7.215)	(7.740)	(10.609)	(9.152)	(8.436)	(7.829)	(8.282)	(7.258)	(10.581)	(11.140)
Effect of democracy after 25 years	17.791	13.800	16.895	17.715	13.263	12.721	14.713	10.500	10.076	8.537	20.853	29.528
	(5.649)	(5.550)	(5.297)	(5.455)	(7.281)	(7.371)	(7.128)	(6.653)	(6.245)	(6.032)	(7.731)	(7.772)
Persistence of GDP process	.973	.967	.963	.960	.946	.946	.947	.944	.938	.941	.953	.952
	(.006)	(.005)	(.005)	(.007)	(.009)	(.009)	(.009)	(.009)	(.011)	(.010)	(.009)	(.009)
AR2 test *p*-value					.01	.08	.51	.95				
Unit root test *t*-statistics	−4.79	−5.89	−4.13	−7.00								
p-value (reject unit root)	.00	.00	.00	.00								
Observations	6,790	6,642	6,356	5,688	6,615	6,467	6,161	5,513	6,615	6,467	6,161	5,513
Countries in sample	175	175	175	175	175	175	175	175	175	175	175	175

As shown in the table above, the results of the estimations confirm the positive effect of democracy (democratization) on the economy. The important row to observe is the line of "long-run effect of democracy". On the line different results are reported according of the different composition of the model used and on the different econometric method applied. Nevertheless, all the value are extremely positive and quire relevant in magnitude[149]. On average democracy affects GDP per capita after 25 years of democratic regime by 20-25%.

[148] Figure taken from ACEMOGLU D., NAIDU S., RESTREPO P., ROBINSON J. A., *Democracy does cause growth*, Journal of Political economy, 127, 2019, 47-100.
[149] Coefficients multiplied by 100

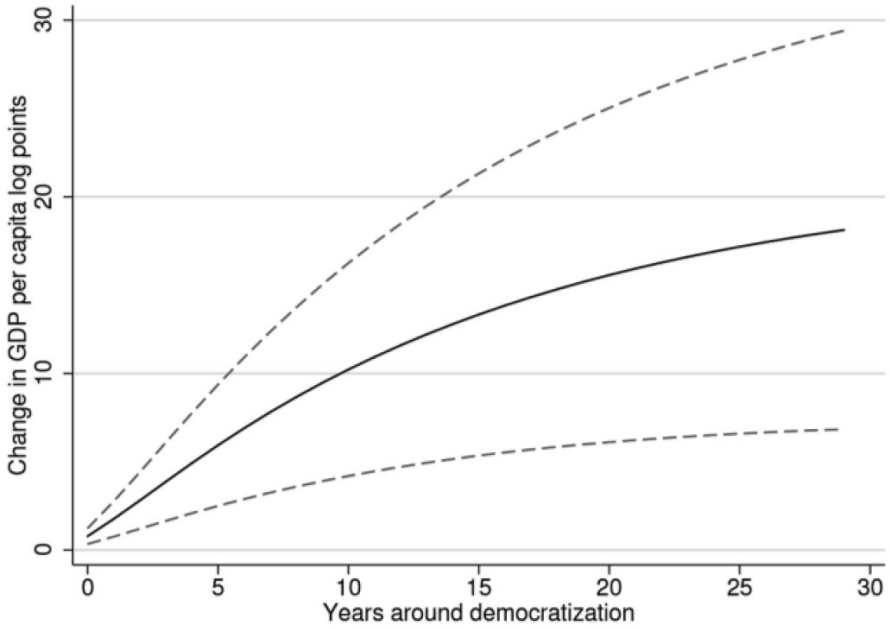


FIGURE II.2 OVER-TIME EFFECT OF DEMOCRACY ON LOG GDP PER CAPITA[150]

These astonishing values are quite robust, according to Acemoglu and al., because when other estimation model is applied, principally semiparametric estimates, the results do not change. Moreover, these quantitative conclusions find support also from other scholars. The main contribution is *Mastering Panel Metrics: causal impact of democracy on growth* by Chen et al.[151]. Starting from an incredibly detailed examination of the panel data analysis conducted by Acemoglu et al. they

[150] Figure taken from ACEMOGLU D., NAIDU S., RESTREPO P., ROBINSON J. A., *Democracy does cause growth*, Journal of Political economy, 127, 2019, 47-100. The dotted lines represent the 95% confidence interval.
[151] CHEN S., CHERNOZHUKOV V., FERNÁNDEZ-VAL I., *Mastering Panel Metrics: causal impact of democracy on growth*, AEA Papers and proceedings, 109, 2019, 77-82.

discover, through the application of innovative econometric methods, that the estimators presented in the above cited articles may be "*biased to the degree that invalids statistical inference*" [152]. To verify the quality of these estimators, eliminating the possible biases present, both analytical and split sample methods are applied to the Acemoglu dataset[153]. As shown in the table below, the new estimates are quite like the original results[154], supporting the quality of the original work. Like before, the interest of the reader must be on the "long-run effect of democracy (x100)" row. On each sub-group of the table is possible to observe the original values from the 2019 article and the two new estimates produced with the two distinct econometric methods.

[152] Citation taken from page 77 of CHEN S., CHERNOZHUKOV V., FERNÁNDEZ-VAL I., *Mastering Panel Metrics: causal impact of democracy on growth*, AEA Papers and proceedings, 109, 2019, 77-82.
[153] To ensure a better performance of the techniques a balances sub-panel composed by 147 countries observed in time from 1987 through 2009.
[154] Interestingly enough, the results are even more positive and quantitatively higher.

TABLE II.5 ROBUSTNESS OF ACEMOGLU ET AL. RESULTS[155]

	Initial and debiased FE			Initial and debiased AB		
	FE	DFE-A	DFE-SS	AB	DAB-SS1	DAB-SS5
Short-run effect of democracy (× 100)	1.89	2.27	2.44	3.94	5.22	4.53
	(0.65)			(1.50)		
	[0.64]	[0.64]	[0.96]	[1.52]	[1.83]	[1.91]
First lag of log GDP	1.15	1.23	1.30	1.00	0.98	1.03
	(0.05)			(0.06)		
	[0.05]	[0.05]	[0.08]	[0.06]	[0.07]	[0.08]
Second lag of log GDP	−0.12	−0.14	−0.13	−0.06	−0.05	−0.07
	(0.06)			(0.06)		
	[0.05]	[0.05]	[0.08]	[0.06]	[0.07]	[0.07]
Third lag of log GDP	−0.07	−0.09	−0.13	−0.04	−0.04	−0.06
	(0.04)			(0.04)		
	[0.04]	[0.04]	[0.06]	[0.04]	[0.04]	[0.04]
Fourth lag of log GDP	−0.08	−0.08	−0.08	−0.08	−0.08	−0.08
	(0.02)			(0.03)		
	[0.02]	[0.03]	[0.04]	[0.03]	[0.03]	[0.03]
Long-run effect of democracy (× 100)	16.05	25.91	25.69	20.97	26.46	25.24
	(6.67)			(9.51)		
	[6.63]	[9.31]	[12.12]	[9.38]	[10.72]	[11.29]

An interesting point of reflection is advanced by Eberhardt in two of his most recent studies: *Democracy does cause growth: comment*[156] and *Democracy, growth, heterogeneity, and robustness*[157]. In the first work, the authors start introducing the critic that the Acemoglu results are sensitive to sample selection due to strong cross-section dependence. He therefore demonstrates that non-random changes in the country sample affect the final results changing the pool of countries by end year and by small number of observations. This situation makes absolutely necessary to take into consideration observable and unobservable

[155] Table taken from CHEN S., CHERNOZHUKOV V., FERNÁNDEZ-VAL I., *Mastering Panel Metrics: causal impact of democracy on growth*, AEA Papers and proceedings, 109, 2019, 77-82.
[156] EBERHARDT M., *Democracy does cause growth: comment*, discussion paper, 2019.
[157] EBERHARDT M., *Democracy, growth, heterogeneity, and robustness*, European Economic Review, 147, 2022.

heterogeneity[158] in constructing any econometric model. The model proposed in this article is based on difference-in-difference specifications with the introduction of a multi-factor error structure. It is implemented following the *"spirit of Chan and Kwok's estimator"*[159] but presenting a dynamic cross-section-augmented distributed lag (CS-DL) specification. The results of these models are in the figures below.

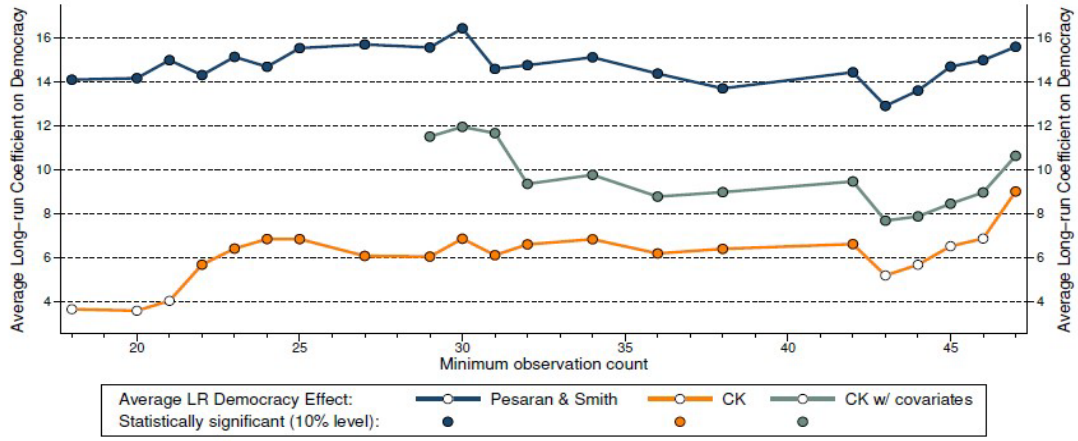


FIGURE II.3 HETEROGENEOUS PARAMETER ESTIMATORS IN SAMPLE REDUCTION BY NUMBER OF OBSERVATION[160]

[158] In literature has been emphasised in panel time series a form of time-varying heterogeneity.
[159] Citation at page 11 taken from EBERHARDT M., *Democracy does cause growth: comment*, discussion paper, 2019.
[160] Figure taken from EBERHARDT M., *Democracy does cause growth: comment*, discussion paper, 2019.

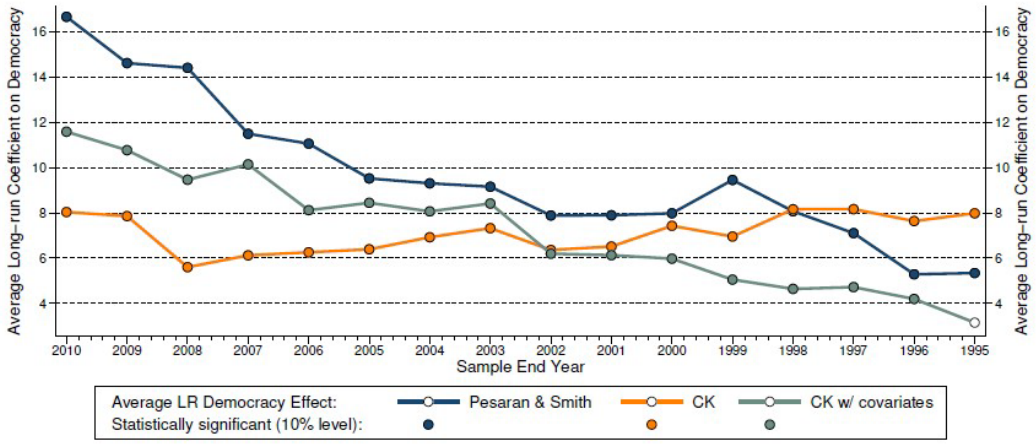


FIGURE II.4 HETEROGENEOUS PARAMETER ESTIMATORS IN SAMPLE REDUCTION BY END YEAR[161]

In both figures, the estimations done by the econometric technique described above are those denominated "CK" and "CK w/covariates". While the first is plain vanilla so without any additions, the second presents the addition of some covariates as gross investment ratio and trade openness. What emerges from both the models, allowing for parameter heterogeneity in democracy as well as for GDP dynamics, in both the sample reductions is long-run democratic coefficient of around 10%. This value is the mean between the results with the plain vanilla CK model (values always lower than 10) and the CK w/covariates model (values always higher than 10).

[161] Figure taken from EBERHARDT M., *Democracy does cause growth: comment*, discussion paper, 2019.

Already with the results of this first work it is possible to observe the significant difference in value between these estimations and the Acemoglu estimations. Here the coefficient of the effect of democracy on economic development is around 10% overall while in Acemoglu the long-run coefficient is around 25%.

In his second work on the topic, Eberhardt starting from the same theoretical standpoints introducing heterogeneity, and using even more recent econometric methods, develops a more detailed democracy-economy model. Here, he adopts the newest Chan and Kwok's Principal Component in Difference in Difference (PCDID) estimator using as in the previous work the dynamic CS-DL version of the estimator.

As shown in column four of the table, even with the newest econometric technique, the results still remain approximately the same, with a value for the democracy long-run effect on GDP per capita of 10%.

TABLE II.6 HETEROGENEOUS PANEL ESTIMATORS[162]

ANRR definition—Dynamic specifications.

	Plain vanilla		With covariates	
	(1)	(2)	(3)	(4)
Implementation	MG	C&K MG	MG	C&K MG
Parameters estimated	5 × N	14 × N	13 × N	22 × N
(a) Full sample	16.624	7.692	7.712	10.074
(ANRR definition)	(4.630)***	(2.854)***	(3.647)**	(3.651)***
Observations	2443	2443	2443	2443
Countries (N)	61	61	61	61
Democratisations	78	78	78	78
Reversals	42	42	42	42
Avg Years in Dem	19.6	19.6	19.6	19.6
RMSE	18.861	7.942	8.515	4.115

What represents an important innovation in the field is the successive step made by Eberhardt in the second part of the study. Thanks to the econometric method applied, he can analyse the potential heterogeneity of the "treatment effects". In the below table are reported the results of the estimation on lower, median, and upper quartile.

[162] Table taken from EBERHARDT M., *Democracy, growth, heterogeneity, and robustness*, European Economic Review, 147, 2022.

TABLE II.7 HETEROGENEOUS PANEL ESTIMATIONS WITH QUARTILES[163]

Main results—Dynamic specifications—Quartile TE.

	Plain vanilla		With covariates	
	(1)	(2)	(3)	(4)
Implementation	MG	C&K MG	MG	C&K MG
(a) Democracy (ANRR)				
Robust mean	16.624	7.692	7.712	10.074
	(4.630)***	(2.854)***	(3.647)**	(3.651)***
Lower quartile	−1.713	−4.156	−6.006	−2.591
	(7.708)	(3.257)	(6.725)	(4.963)
Median	15.299**	7.067*	8.209	10.872*
	(5.430)	(3.445)	(4.219)	(4.381)
Upper quartile	40.153***	22.403***	26.525***	31.099***
	(7.980)	(5.427)	(7.031)	(5.551)
Countries (N)	61	61	61	60

Looking at column four, it is demonstrated the heterogeneity of "treatment effects" since the effect of democracy on growth in the lower quartile is insignificant, in the median quartile is significant and around the 11% while in the upper quartile the effect is significant and with an astonishing value of 31%. As opposed to Acemoglu, here there is econometric and empirical proof of the "heterogenous democracy-growth nexus", so that democracy affects the economy of different countries in diverse ways and with different strength.

[163] Table taken from EBERHARDT M., *Democracy, growth, heterogeneity, and robustness*, European Economic Review, 147, 2022.

In the end, what clearly emerges from the literature is that there is substantial empirical proof to sustain the thesis "democracy does cause growth" at least in the long run. The intensity of this causal relationship is still yet debate but the baseline is that democracy does cause growth over time in a quite important way given the fact that the more conservative value of the coefficient is estimated around 10%.

Having established the democracy effect on the long run, it is important to analyse the short and medium run effect, the first period after a democratization process, to have a more comprehensive understanding of the complete process.

In literature this topic is less developed than the previous, but some important works are still present. One of the most cited articles is the *Democratisation and Growth* by Papaioannou and Siourounis[164].

In this work the authors have analysed the evolution of the effects of democracy on real GDP per capita. They have found, focusing on the democratisation processes of the third wave of democratisation[165], that democracy affects the economy following a J-curve. Theoretically, according to this curve, in the first period of democracy the economic growth shows low pace while it increases over

[164] PAPAIOANNOU E., SIOUROUNIS G., *Democratisation and Growth*, The Economic Journal, 118, 2008, 1520-1551.
[165] See introduction and HUNTINGTON S. P., *The third wave: Democratization in the late twentieth century (Vol. 4),* University of Oklahoma press, 2013.

time. To empirically verified this hypothesis, they have developed an econometric model with a series of dummy variables for four non-overlapping, three-year space periods around and after the time of democratisation.

$$g_{i,t} = \alpha_i + \eta_t + \delta_1 D^1_{i,t} + \delta_2 D^2_{i,t} + \delta_3 D^3_{i,t} + \delta_4 D^4_{i,t} + \delta_5 D^5_{i,t} + v_{i,t}.$$

Important to note is the fact that they have also introduced a dummy to analyse any possible "anticipation effect," as increase in economic activity in prevision of a possible regime change. Moreover, some estimations have been conducted with the exclusion of the socialist countries due to very particular history and due to lack of reliability of the data published. The results are in the figure below.

TABLE II.8 EFFECT OF DEMOCRATISATION OVER TIME[166]

	All	No socialist	20 obs.	20 obs; No socialist	
	(1)	(2)	(3)	(4)	(5)
D1: Pre Democratisation [T*−5, T*−4, T*−3]	0.6676	0.6235	0.3230	0.7178	0.3628
p-value	(0.218)	(0.152)	(0.526)	(0.107)	(0.432)
p-value – clustered s.e.	(0.318)	(0.175)	(0.600)	(0.127)	(0.410)
D2: Transition [T*-2, T*-1, T*]	−1.7015	0.2640	−1.0453	0.2480	−0.1523
p-value	(0.007)	(0.604)	(0.087)	(0.470)	(0.756)
p-value – clustered s.e.	(0.050)	(0.065)	(0.171)	(0.410)	(0.774)
D3: Short-run Democratisation [T*+1, T*+2, T*+3]	1.4737	1.1781	1.0667	1.2144	0.5398
p-value	(0.003)	(0.005)	(0.029)	(0.005)	(0.221)
p-value – clustered s.e.	(0.030)	(0.016)	(0.084)	(0.017)	(0.346)
D4: Medium-run Democratisation [T*+4, T*+5, T*+6]	1.2180	0.7009	0.7658	0.7246	0.6187
p-value	(0.009)	(0.087)	(0.091)	(0.084)	(0.129)
p-value – clustered s.e.	(0.053)	(0.161)	(0.145)	(0.155)	(0.227)
D5: Long-run Democratisation [T*+7, onwards]	1.3745	1.1641	1.1979	1.1536	0.8721
p-value	(0.000)	(0.003)	(0.003)	(0.004)	(0.032)
p-value – clustered s.e.	(0.010)	(0.013)	(0.022)	(0.016)	(0.119)
Controls	No	Autoreg/Inc	Autoreg/Inc	Autoreg/Inc	Full
Regional Trends	No	Yes	Yes	Yes	Yes
Adjusted R squared	0.1386	0.2046	0.2206	0.1983	0.2633
Within R squared	0.0659	0.1375	0.1571	0.1368	0.2028
Countries	166	134	135	125	122
Observations	5,410	4,673	4,772	4,555	4,183

The preferred model to observe is reported in column four. Here are excluded all socialist countries. What clearly emerges from the coefficients obtained is the empirical proof for the theoretical J-curve. The value for the coefficient of D3, the three years after the democratisation, is significant and positive around 1.2% while the value for the D4 coefficient, from the fourth to the sixth year after the democratisation, is still significant and positive around 0.72%. Finally, the coefficient for D5, effect after the seventh years is positive with a value of 1.15%.

[166] Table taken from PAPAIOANNOU E., SIOUROUNIS G., *Democratisation and Growth*, The Economic Journal, 118, 2008, 1520-1551.

This influential work has been taken as starting point for Acemoglu et al. (2019). Already in the first pages the authors recognise the importance of the previous study, acknowledging the j-curve in the short-medium time.

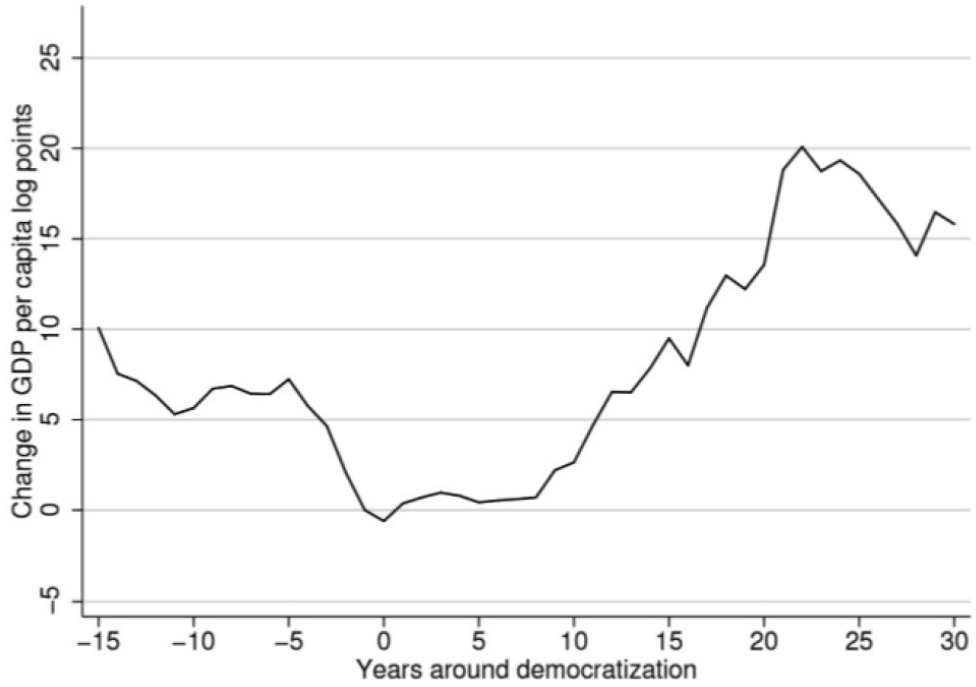


FIGURE II.5 J-CURVE IN THE LONGER PERIOD[167]

This graph obtained with a diverse and bigger dataset is an ulterior confirmation of the J-curve. Here it is possible to see that even the values of the estimations are quite like those of Papaioannou and Siourounis. Two observations are to be made. First, while in the 2008 study the pre-democratisation period had a non-significant

[167] Figure taken from ACEMOGLU D., NAIDU S., RESTREPO P., ROBINSON J. A., *Democracy does cause growth*, Journal of Political economy, 127, 47-100, 2019.

value, here is reported a negative coefficient[168] to show that the economy usually suffers a period of recession before entering the democratisation process[169]. The most probable cause of this dip is the uncertainty diffused before the actual regime change. The other factor to observe in this graph is how, using the estimates previously introduced in this chapter, the democratic effect increases in a quite important way to reach the peak of more than 20% around the 25th year after the regime change.

These estimates, as explained before, have been also taken by Chen et al. in May 2019[170]. Interesting for this topic is that the authors, from the Acemoglu databased and adopting innovative debiased estimators have produced in their model also an estimation for the short time effect of democracy. As shown already in figure 25, their estimation for the short-term effect of democracy, depending on the estimator applied in the econometric model varies from 2.3% to 5.22%[171]. Those values are even more positive then the Papaioannou and Siourounis estimates. The difference can be imputed to the different database used and to the more

[168] ACEMOGLU D., SIMON J., ROBINSON J. A., YARED P., *Income and Democracy*, Working paper, 11205, NBER, 2005.
BRŰCKNER M., CICCONE A., *Rain and the democratic window of opportunity*, Econometrica, 79, 2011, 923-947.
[169] The author has the responsibility to report that the negative coefficient here reported has not a strong econometric value since is very dependent on the sample used and even in Acemoglu 2019 is possible to see insignificant coefficients regarding the pre-democratisation process.
[170] CHEN S., CHERNOZHUKOV V., FERNÁNDEZ-VAL I., *Mastering Panel Metrics: causal impact of democracy on growth*, AEA Papers and proceedings, 109, 2019, 77-82.
[171] These quite generous values are referred to the first year.

developed econometric technique used. Even if with some differences in the empirical quantitative evaluation, the underlying J-curve is confirmed.

To fully exhaust the J-curve analysis so the timing of the effect of democracy on economic development, what happens after the peak of the 25th year need to be considered.

The only source about this matter is an article already cited in this work, *Democracy, growth, heterogeneity, and robustness* by Eberhardt[172]. Here, after having developed the theory of heterogeneity of treatment effects, already explained above, he has studied, using multiple samples, the distribution over time of the democracy effect. Particularly, he has artificially augmented the number of observations by dividing the countries by "democracy experience" on band composed by eleven years, so that the first band is composed by country with up to eleven years of "democratic experience" while the second band is composed by country with a "democratic experience" between two to twelve, and so on. Assuming that the different length of treatment would result in heterogeneous long-run estimates across countries, he has been able to develop a model using

[172] EBERHARDT M., *Democracy, growth, heterogeneity, and robustness*, European Economic Review, 147, 2022.

also the estimates obtained in previously shown figure[173]. The results are reported in the graph below.

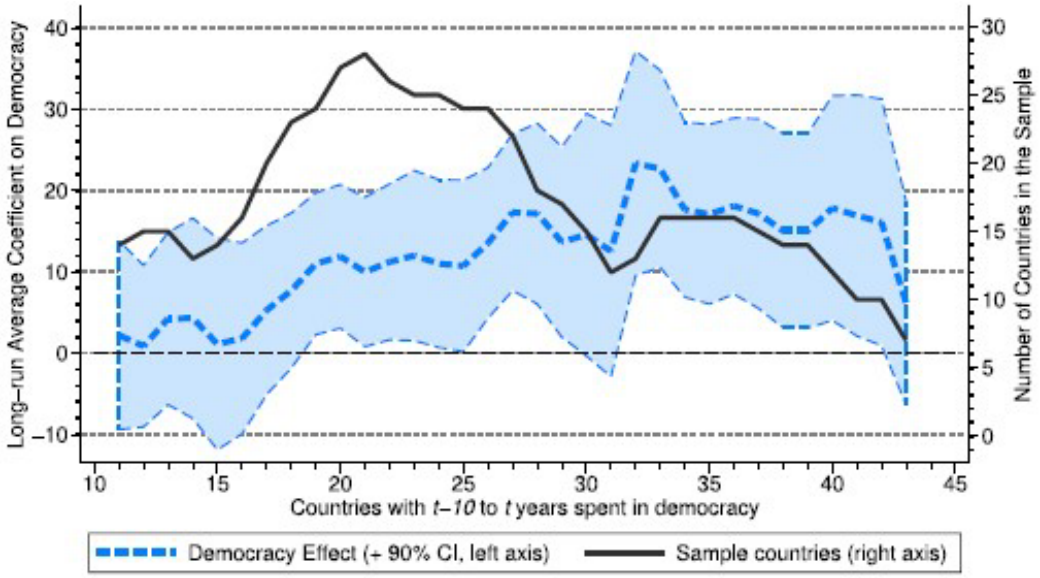


FIGURE II.6 DEMOCRACY EFFECT OVER TIME, FOCUS ON THE LONG RUN[174]

From this figure, it is possible to note how after the peak of the 25th year, the effect plateaus. Due to scarcity of the data for groups with more than 25 years of "democratic experience", it is not possible to statistically determine if the effect declines or remains stable. Another consideration that must be done is that from what emerges from the form of the graph above and from the others figures on this topic, the effect could have a concave relationship, as to indicate that the

[173] See figure 28
[174] Figure taken from EBERHARDT M., *Democracy, growth, heterogeneity, and robustness*, European Economic Review, 147, 2022.

effect of democratisation on economy growth could be a one-off effect. Another possible explanation to this concave form could be that after the peak, the effect could stabilise around a lower value, continuing to enhance growth but with less intensity[175]. Both theories lack the actual data to empirically confirm them.

Summing up, what emerges in this paragraph is that there is a diffused consensus in the scientific community that democracy does cause growth over time, even if some discrepancies emerge about the actual quantitative value of the process. There is consensus about the J-curve, at least until the 25th year from the democratisation process and most of the community agrees that in the long run democracy enhances growth. With time, as soon as the sample of countries with a "democratic experience" bigger than 25 years, will be sufficiently big to conduct proper econometrical investigation, more conclusive analysis must be conducted on the democracy effect over longer run to understand how with the passing of time the J-curve evolves.

II.3.3 Democracy effect over space

Having established the democracy affects the economy with distinct strength over time, the focus of this paragraph is to analyse how the democracy-economy nexus

[175] This hypothesis would be more compatible the MADSEN J. B., RASCHKY P. A., SKALI A., *Does democracy drive income in the world, 1500-2000?*, European Economic Review, 78, 2015, 175-195.

develops in different region of the world. Again, the meta-analysis conducted by Colagrossi et al.[176] can be useful to have a first impression on the topic.

As anticipated above, during their analysis they have discovered that democracy affects growth in distinct way according to the region of the world as shown in the figure below.

[176] COLAGROSSI M., ROSSIGNOLI D., MAGGIONI M. A., *Does democracy cause growth? A meta-analysis (of 2000 regressions)*, European Journal of Political Economy, 61, 2020.

TABLE II.9 META-REGRESSION, FOCUS ON THE WORLD REGIONS[177]

	(1) RE ML (s.e.)	(2) FE (clus. s.e.)	(3) UWLS (clus. s.e.)	(4) RE (clus. s.e.)	Studies [Eff. sizes]
World regions					
Africa	0.1757***	0.0755	0.0755*	0.1742*	161
	(0.0148)	(0.0414)	(0.037)	(0.0814)	[1773]
East Asia	−0.0289	0.0283	0.0283	0.0783	150
	(0.0431)	(0.0787)	(0.0702)	(0.1033)	[1657]
East Europe	0.0148	−0.0096	−0.0096	0.0267	125
	(0.0187)	(0.0189)	(0.0169)	(0.0333)	[1388]
Latin	−0.0120	0.0093	0.0093	0.0467	152
America	(0.0193)	(0.0249)	(0.0222)	(0.0492)	[1682]
Middle East	0.0310	0.0189	0.0189	0.0296	155
	(0.0182)	(0.0214)	(0.0191)	(0.0499)	[1561]
South Asia	−0.1117**	−0.0699	−0.0699	−0.2547**	146
	(0.0412)	(0.0823)	(0.0735)	(0.0942)	[1642]
High-	0.0241*	−0.0082	−0.0082	0.003	129
income	(0.0094)	(0.0104)	(0.0093)	(0.0217)	[1299]
Region	−0.0062	0.0076	0.0076	0.0177	33
dummies	(0.0102)	(0.0066)	(0.0059)	(0.02)	[211]

Looking at the table, the region where the democracy-economy nexus is stronger is Africa. Also, high-income countries have shown good strength of the nexus but with a coefficient less statistically relevant. The opposite sign is observed with good statistical relevancy and quite important negative value is South Asia, where democracy appears to be detrimental to economic growth. For the other selected regions of the world, no statistically relevant coefficient can be observed.

Once having describe the general picture, it is time for a more detailed analysis.

[177] Table taken from COLAGROSSI M., ROSSIGNOLI D., MAGGIONI M. A., *Does democracy cause growth? A meta-analysis (of 2000 regressions)*, European Journal of Political Economy, 61, 2020.

One of the world regions where the democracy-economy nexus is most analysed is Africa especially from the 1950s when most African states have regained their independence[178]. one of the most important contributions to thus topic is *Political institutions and economic growth in Africa's "Renaissance"* by Bates et al.[179]. Here, the authors, have developed a regional approach to the topic. Using an approach that will later be better described, the channel effects, they have been successful to confirm that democracy, or democratic transition, does cause growth. In their approach, the institution of democratic regimes causes the implementation of democratic reforms. Those have been proved to be instrumental in economic development as shown in the figure below.

[178] In the continent international organizations are, since day 1, big promoters of the diffusion of democracy. one of the most important player in this sense is the International Monetary Fund (IMF) that requires every time a country for democratic reform in exchange for monetary support.
[179] BATES R., BLOCK S. A., *Political institutions and economic growth in Africa's "Renaissance"*, Oxford economic papers, 2018.

TABLE II.10 AFRICA RENAISSANCE CAUSED BY DEMOCRACY[180]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	GDP Growth FE	GDP Growth FE	GDP Growth FE	GDP Growth FE	GDP Growth FE	GDP Growth FE	GDP Growth FE
L_Reform Index	4.801**	4.653**	4.886**	5.254**	4.516**	4.235*	3.334
	(2.246)	(2.229)	(2.323)	(2.187)	(2.193)	(2.332)	(2.680)
L_Civil War		−1.134**					−1.940***
		(0.570)					(0.666)
L.log Rainfall			−0.800				−0.0749
			(1.684)				(1.871)
L_Change in ToT Adjustment				−0.00278			−0.000159
				(0.00551)			(0.00592)
L_log Debt Forgiveness					0.0901		0.257***
					(0.0632)		(0.0843)
L_IMF Agreement						0.753	0.0449
						(0.565)	(0.869)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Ctys	27	27	25	22	27	27	20
Observations	721	721	588	506	717	721	412
R-squared	0.196	0.199	0.208	0.225	0.199	0.198	0.253

As possible to see, the coefficients of democratic reform are positive and statistically significant in every model developed, excluded the last, likely due to introduction of too many independent variables. Relevant to note, is also the introduction in model two and eight of the independent variable "civil War". The present of it emphasises the regional specificity of the model construct.

[180] Table taken from BATES R., BLOCK S. A., *Political institutions and economic growth in Africa's "Renaissance"*, Oxford economic papers, 2018.

Unfortunately, civil wars, even today, are still reality in the African continent, while in the rest of the world only few isolated episodes are reported.

Going deep into the Africa analysis using a more disaggregate approach, few countries arise from the others. Those are, according to Narayan et al. (2011)[181], Botswana, Madagascar, Niger, Rwanda, South Africa, and Swaziland. These results do not contradict the general results introduced before, due to the very specific disaggregated approach here implemented based on different data and with a particular model designed to analyse granger causality and reciprocity that for some parts do not belong in this work[182]. This method results also quite dependent on data selection.

Another important contribution to this topic, comes from a panel presented in Eberhardt (2022)[183].

[181] NARAYAN P. K., NARAYAN S., SMYTH R., *Does democracy facilitate economic growth or does economic growth facilitate democracy? An empirical study of Sub-Saharan Africa*, Economic Modelling, 28, 2011, 900-910.
[182] For the interested reader the complete models are reported in Appendix D
[183] EBERHARDT M., *Democracy, growth, heterogeneity, and robustness*, European Economic Review, 147, 2022.

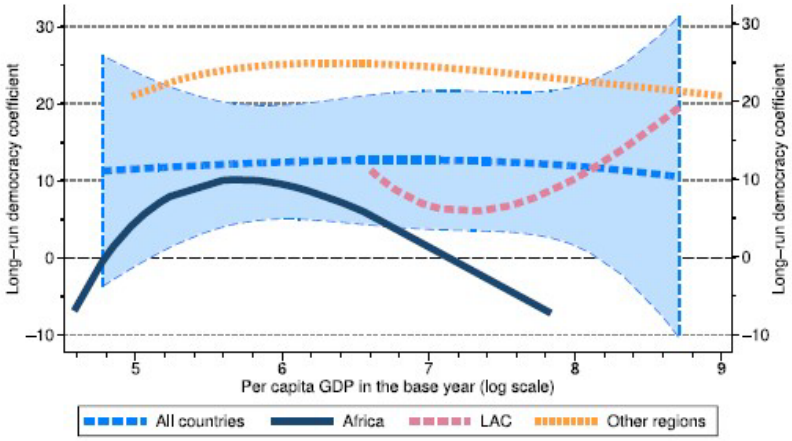


FIGURE II.7. HETEROGENEITY OF DEMOCRACY-ECONOMY NEXUS AROUND THE WORLD

In this figure is possible to observe how on average the level of GDP per capita on base year does not influence the democracy effect on growth. Relevant for the African topic is that the author here, based on the heterogeneity models described above, has founds some evidence that Africa is the only region of the world where the initial level of GDP per capita has the power to influence the democracy-economy nexus. Interesting enough, the countries at both extremes of the distribution can experience negative democratic effect on growth while those in the middle can experience democratic effect alienated to the world average[184].

[184] On this aspect at the moment is the only contribution. The author of this work is optimistic for the fact that more studies will be conducted on this topic in the near future given the important implications that this line of investigation present.

From all the data presented, it is possible to confirm empirically that in Africa democracy does cause growth, and according to some stimes, even in a stronger way than what presented in the meta-analysis shown at the beginning of this paragraph. Important to expand soon is the literature on how the level of GDP per capita at the beginning of the process may influence the democracy effect on growth.

Moving North-East from the centre of Africa the Middel-East North-Africa (MENA) region is encountered. The region is since the end of the second world war characterized by instability, especially from a political standpoint, and low level of democracy[185]. Both instability and low democracy are the primary causes, according to Rachidi et al. (2015)[186], to the negative values of the democracy effect on growth estimated in their model based on generalized method of moments (GMM) system, specifically designed for the MENA region[187]. Below are reported both the equation underlying the developed model and the results obtained.

$$GROWTH_{it} = \beta_1 \mathrm{INF}_{it} + + \beta_2 \mathrm{TRADE}_{it} + \beta_3 \mathrm{GOVTSIZE}_{it} + \beta_4 \mathrm{POP}_{it} + \beta_5 \mathrm{DEMOCRACY}_{it} + \varepsilon_{it}$$

[185] Cultural, religious, and historical motives are the major causes of this situation.
[186] RACHIDI H., SAIDI H., *Democracy and economic growth: evidence in MENA countries*, Procedia-Social and Behavioral Science, 191, 2015, 616-621.
[187] In this empirical study the countries analysed are the following: Algeria, Bahrain, Egypt Arab Rep, Iraq, Iran, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, Turkey and United Arab Emirates.

TABLE II.11 DEMOCRACY-GROWTH NEXUS IN THE MENA REGION[188]

	democ	autoc	xrcomp	xropen	xconst
L. growth	-0.200	-0.194	-0.195	-0.197	-0.198
	(2.08)**	(2.06)**	(2.06)**	(2.06)**	(2.08)**
GOVTSIZE	-0.235	-0.208	-0.237	-0.227	-0.237
	(2.28)**	(2.27)**	(2.29)**	(1.28)	(1.79)*
INF	0.273	0.271	0.267	0.266	0.271
	(2.29)**	(2.29)**	(2.29)**	(2.29)**	(2.29)**
POP	15.551	15.503	15.541	15.561	15.594
	(1.88)*	(1.93)*	(1.90)*	(1.91)*	(1.89)*
TRADE	-2.409	-2.482	-2.451	-2.478	-2.434
	(2.39)**	(2.41)**	(1.68)*	(2.40)**	(0.39)
Democracy	-0.088	-0.083	-0.090	-0.086	-0.088
	(3.98)***	(1.98)**	(2.00)**	(2.09)**	(0.98)
N	339	339	339	339	339
AR (2)	1.40	1.42	1.41	1.41	1.41
P-value	0.160	0.156	0.160	0.160	0.160
Hansen	12.06	12.08	12.06	12.06	12.06
P-value	0.969	0.969	0.970	0.969	0.969
Wald χ^2	18.93***	18.84***	18.86***	18.76***	18.89***

To test the robustness of their results five different democracy measurements[189] are implemented as reported in figure. The coefficient for democracy, as expected, is negative and statistically significant for all but one democracy indicator. These results demonstrate the negative democracy effect on growth.

The differences in the estimates between Africa and the MENA region already confirm the spatial heterogeneity of the democratic effect.

The last region of the world here analysed is Asia, likely where the link between democracy and economy is controversial the most. Thanks to the economic

[188] Table taken from RACHIDI H., SAIDI H., *Democracy and economic growth: evidence in MENA countries*, Procedia-Social and Behavioural Science, 191, 2015, 616-621.
[189] All the democracy measures are taken from the PolityIV project.

success of different countries, especially in the far East[190], where economic growth has been outstanding while autocratic regimes are still in place, democracy does not appear to be a priority[191]. On these countries is based the work of Tang and Yung[192]. They have adopted the autoregressive distributed lag (ARDL) bounds test methodology to investigate for the timespan from 1984 to 2003, the nature of the democracy-economy nexus. The results of their models show how in Asia this nexus can produce different results across the region. The main estimations are produced by the ARDL model:

$$\Delta \dot{\mathrm{GDP}}_t = \alpha + \theta \dot{\mathrm{GDP}}_{t-1} + \sigma \mathrm{DA}_{t-1} + \sum_{j=1}^{p-1} \beta_{\dot{\mathrm{GDP}},j} \Delta \dot{\mathrm{GDP}}_{t-j} + \sum_{j=1}^{q-1} \beta_{\mathrm{DA},j} \Delta \mathrm{DA}_{t-j} + \varpi \Delta \mathrm{DA}_t + \mu_t$$

where the evolution over time of the GDP is influenced by changes in democracy level, here measured with the Democratic Accountability index[193] while controlling for lags of economic growth. The final results are reported in the figure below. To better understand the table, it is important to explain how the ARDL estimation method works in this instance. The entire model is based on the

[190] Hong Kong, Indonesia, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand are known in literature as "high performing Asian economies (HPAEs).
[191] This economic success in less democratic states has contributed to the development also in the West, as already explained in the introduction, of an economic theory where autocratic states are considered to be more suited to promote economic development than democratic states.
[192] TANG S. H. K., YUNG L. C. W., *Does rapid economic growth enhance democratization? Time-series evidence from high performing Asian economies*, Journal of Asian Economics, 19, 2008, 244-253.
[193] The Democratic Accountability index is prepared by the International Country Risk Guide (ICRG). It ranges from 0 (most autocratic) to 5 (most democratic).

null hypothesis of no long-run relationship between democracy and growth[194]. To not reject the null the value of the F-statistic must be below the critical lower critical value while to reject the null, the value must be higher than the upper critical value. If the value of the F-statistic falls between the critical values, the test is inconclusive.

In the model reported below, the upper and lower critical value bounds for the F-statistics are 7.84 and 6.84 for the 1% significance level, 5.73 and 4.94 for the 5% significance level, and 4.78 and 4.04 for the 10% significance level.

[194] This method yields two asymptotic critical values.

TABLE II.12 DEMOCRACY EFFECT ON GROWTH IN HIGH PERFORMING ASIAN ECONOMIES[195]

Country	Sample period	No. of obs.	p^*	q^*	F-statistic H_0: No long-run relationship	π [P-value] H_0: $\pi = 0$
Hong Kong	1984Q2 2003Q4	79	1	2	5.418*	0.010 [0.068]
Indonesia	1994Q2 2003Q4	39	1	1	5.040*	0.033 [0.067]
Malaysia	1992Q2 2003Q4	47	1	2	5.657*	0.019 [0.060]
Philippines	1984Q2 2003Q4	79	1	1	6.066**	0.012 [0.179]
S. Korea	1984Q2 2003Q4	79	2	1	13.188***	−0.012 [0.008]
Singapore	1984Q2 2003Q4	79	7	1	14.566***	0.052 [0.002]
Taiwan	1984Q2 2003Q4	79	2	1	7.429**	−0.017 [0.027]
Thailand	1994Q2 2003Q4	39	1	1	11.209***	−0.088 [0.004]

The first thing to note is that the estimation produces significant values for all the countries analysed. The coefficients are both positive and negative. Democracy is expected to have a positive effect on economic growth in Hong Kong, Indonesia, Malaysia, Philippines, and Singapore while in South Korea, Taiwan, and Thailand democracy has shown a negative influence on economic growth. The causes of these differences are still debated in the community. Tang and Tung in this article suggest an interpretation based on the distinct goals followed by the democracies analysed. According to the authors, in this sample democracies have pursued alternatively economic growth, so that the coefficients in the estimation are

[195] Table taken from TANG S. H. K., YUNG L. C. W., *Does rapid economic growth enhance democratization? Time-series evidence from high performing Asian economies*, Journal of Asian Economics, 19, 2008, 244-253.

positive, or a more redistribution system, slowing economic growth while enhancing the well-being of the population.

Another approach to the topic is taken by Rock (2009)[196]. To analyse if autocracy is better suited to promote growth, he has developed an econometric model where various aspects of the bureaucratic state are included together with the country ability to adhere to the rule of law[197]. Those features are added because they are considered essential to for countries to implement their developmental visions.

TABLE II.13 DEMOCRACY AND AUTOCRACY REGRESSION ON GROWTH[198]

Equation	(1)	(2)	(3)	(4)
Independent variables				
C	−52.30	.03	.98	.19
SDT	77.80 (1.29)	14.40 (2.70)***		
SAT	69.23 (1.33)			
SM	−3.35 (−.88)	.18 (.13)	−.71 (−.63)	−.19 (−.16)
SCSDT			1.95 (3.20)***	
DOSAT		15.12 (2.80)***		
SCDOSAT			1.88 (2.97)***	
SCSDTIVP				4.27 (2.94)***
SCDOSATVP				2.28 (2.98)***
POPG	−2.18 (−.90)	−.06 (−.07)	−.01 (−.01)	.72 (.89)
GCY	−1.80 (−1.05)	−.89 (−2.03)**	−.61 (−1.93)**	−.22 (−.90)
TRDY	.07 (.85)	−.01 (−.77)	.001 (.03)	−.02 (−1.16)
FDIY	.74 (.99)	.63 (2.16)**	.61 (2.07)**	.14 (.57)
LINFLATE	−.50 (−.46)	.02 (.04)	−.67 (−1.89)*	−.42 (−1.09)
#Cross sections	12	12	12	12
N	218	206	206	206
Equation *F*	7.14***	5.91***	5.91***	5.91***
Adjusted R^2	−4.47	.02	.38	.26

The most important coefficients are in column four and they are both statistically significant, to highlight the quality of the results. The two rows to observe are

[196] ROCK M. T., *Has democracy slowed growth in Asia?*, Worl Development, 37, 2009, 941-952.
[197] Data taken from The Political Risk Services Group.
[198] Table taken from ROCK M. T., *Has democracy slowed growth in Asia?*, Worl Development, 37, 2009, 941-952.

SCSDT/VP and SCDOSATVP. The two variables, computed by the author, represent the state capacity in transitional democracies with fewer veto players and the state capacity in developmentally orientated authoritarian regimes with more veto players. Both coefficients are positive, but what is important is that the coefficient linked to the democratic states are higher than the counterpart. Excluding all the others results, not pertinent to this work, these results highlight two aspects. The first, in Asia there are several economic efficient autocratic states. The second, more important, is that democracy with a good state capacity and fewer veto players are more efficient than the autocratic counterparts. With this last result, it is demonstrated that democracy in Asia is a better promoter of growth than autocracy.

From both these distinct studies, what clearly emerges is the confirmation that democracy affects the economy across the Asian region in distinct ways, as for both the MENA and the African region.

II.4 **CONCLUSIVE REMARKS**

In this chapter has been analysed the democracy-growth nexus. It has been argued that democracy does cause growth, and its effect is not insignificant, especially over time. Nevertheless, this effect is not constant, or it remains the same over time and over space, so that, after a first general analysis of the literature, two

distinct paragraphs have been devoted to fully investigate the temporal and spatial effect of democracy on economic development.

In the following chapter, the democracy-growth nexus will be studied from a different angle, to give the reader a truly comprehensive picture of the matter.

III. CHANNEL EFFECTS

III.1 INTRODUCTION

Having shown how democracy heterogeneously affects the economy depending on time and space, the last aspect to consider to fully exhaust the topic is how and if democracy influences growth indirectly. In literature this topic is called "channel effect". The theory behind, is that democracy does not influence growth only directly but also indirectly, through the promotion the development of other institutional factors that contribute to the economic growth.

The literature is very developed, and while there is no complete accord in the community, some key issues find ample support. In the following parts of this chapter the most important aspects are reported in the following order: stability channel effect, accumulation of human capital channel effect, innovation channel effect, and better institutions channel effect.

In literature other channel effects have been proposed during the years like the influence of democracy on government consumption or distribution of income. Some authors have proposed the importance of state capacity or the changes in physical capital accumulation as medium to link democracy and growth. All those and others are not here reported because, for some, data was inconclusive or too data-source dependant, while others have been previously introduced in literature but with time, they have lost their relevance.

III.2 **STABILITY CHANNEL EFFECT**

One first aspect that needs to be cited is how democracy promotes growth over time through the ability to maintain a more stable economic environment compared to autocracy. It has been demonstrated that democracy has been able to guarantee a lower economic growth volatility (EGV) than authoritarian states[199]. The authors have constructed a random-effect model on a panel of 140 countries with data from 1975 to 2007, to investigate the effect of democracy on the EGV. The first conclusion that emerges from the results is that democracy does reduce EGV by an estimated effect of -1.3%.

[199] MATHONNAT C., MINEA A., *Forms of democracy and economic growth volatility*, Economic Modelling, 81, 2019, 594-603.

TABLE III.1 DEMOCRACY EFFECT ON EGV[200]

	Political Regimes
	(1)
Democracy	−1.320***
	[0.258]
Log_GDP_pc	−0.633***
	[0.161]
Growth	0.0356
	[0.0314]
Log_gvt_sp	1.045***
	[0.398]
Sdterm_trade	3.332***
	[1.217]
Log_pop	−0.672***
	[0.138]
Climate shocks	0.0271*
	[0.0142]
Control gvt. forms	No
Control elec. rules	No
Control state forms	No
Control V-P	No
Control Age Dem	No
Obs./Countries	1168/135
R-squared/Rho	0.19/0.05
Wald test p-value	0.00

The primary cause of this astonishing difference is the check and balance typical of democratic regimes: thanks to those, democracies are more apt to limit both the internal and the external shocks.

This capability has been also described in previous years by Rodrik[201]. In his seminar work, analysing data from the 1970s on 101 countries, has indeed

[200] Table taken from MATHONNAT C., MINEA A., *Forms of democracy and economic growth volatility*, Economic Modelling, 81, 2019, 594-603.

[201] RODRIK D., *Institutions for High-Quality Growth: What they are and how to acquire them*, Studies in Comparative International Development, 35, 2000, 3-31. Inside this work, interestingly enough, the author computes also an estimation of the effect of democracy on economic volatility in the short run. The coefficient estimated is surprising very similar to the one reported above, with a value of -1.31. The full figure with the results from the model is reported in Appendix D.

discover that countries with higher levels of political freedom experienced lower economic growth decline after the external economic shock of the 1970s.

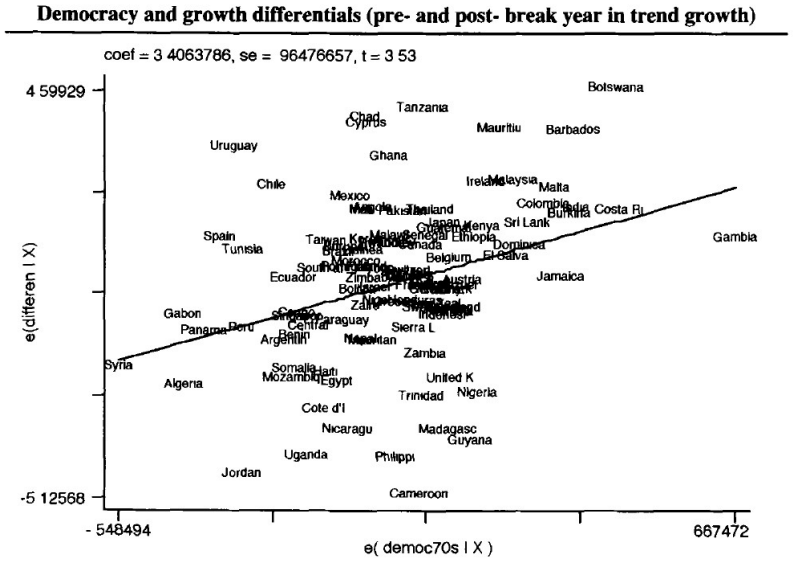


FIGURE III.1 DEMOCRACY AND GROWTH VOLATILITY[202]

The cause proposed by Rodrik for these better results is that to adjust to shock it is essential to manage social conflicts, and the better regime to do that is democracy. the Rodrik's theory behind this statement is that participatory institutions are less likely to suffer of "coordination failure," in which social factions fail to coordinate to produce an outcome that would be highly beneficiary for all system, due to their intrinsic nature of conflict management institution. To do so, they entail a double "commitment technology" that incentives groups to cooperate by

[202] Figure taken from RODRIK D., *Institutions for High-Quality Growth: What they are and how to acquire them*, Studies in Comparative International Development, 35, 2000, 3-31.

reducing the payoff of socially uncooperative strategies, warning the potential winners of the social conflict that their win would be limited while assure the potential losers not to be expropriated.

Volatility, as channel effect of democracy on growth, has been also studied in relation medium-term changes in growth trends, to avoid the influence of short-term growth cycles in the estimations. The most important study on this matter is *Democracy, diversification, and growth reversals* by Cuberes and Jerzmanowski[203]. The authors, using data from 1950 to 2000, have estimated the interaction effect of democracy on growth reversal, as shown in the figure below.

[203] CUBERES D., JERZMANOWSKI M., *Democracy, diversification and growth reversals*, The Economic Journal, 119, 2009, 1270-1302.

TABLE III.2 INTERACTION EFFECT OF DEMOCRACY ON GROWTH REVERSAL[204]

	Fixed Effects	Pooled OLS	GMM	System GMM
Growth before Break	−1.103***	−0.453	−1.157***	−0.992***
	(0.332)	(0.320)	(0.361)	(0.323)
Democracy × Growth Before Break	0.485*	0.573**	0.764*	1.014***
	(0.265)	(0.258)	(0.398)	(0.329)
Income × Growth Before Break	−0.184	−0.050	−0.182	−0.154
	(0.194)	(0.080)	(0.177)	(0.138)
Income	−0.014	0.002	−0.011	0.003
	(0.017)	(0.003)	(0.034)	(0.007)
Democracy	−0.028	0.000	−0.014	−0.005
	(0.019)	(0.009)	(0.016)	(0.014)
Hansen p-value			0.20	0.26
R^2	0.49	0.15		
N	197	197	95	197

The positive and statistically significant coefficients associated to the interaction effect at the second row, support the thesis that in democratic regimes growth reversals are less pronounced. According to the authors, democracy does not only promote less pronounced growth reversal, but also it diminishes the frequency of the phenomena[205]. In the figure below the kernel smoothed densities of the magnitude of the growth changes for democracies and non-democracies are confronted. The results reflect what explained before: democracies are less likely to experience a growth reversal and when they do, they show less pronounced inversions.

[204] Table taken from CUBERES D., JERZMANOWSKI M., *Democracy, diversification and growth reversals*, The Economic Journal, 119, 2009, 1270-1302.

[205] The authors in their work, to demonstrate this point have created a model to study the probability of growth reversal in democracies. For the interested reader the model with the results is reported in Appendix D.

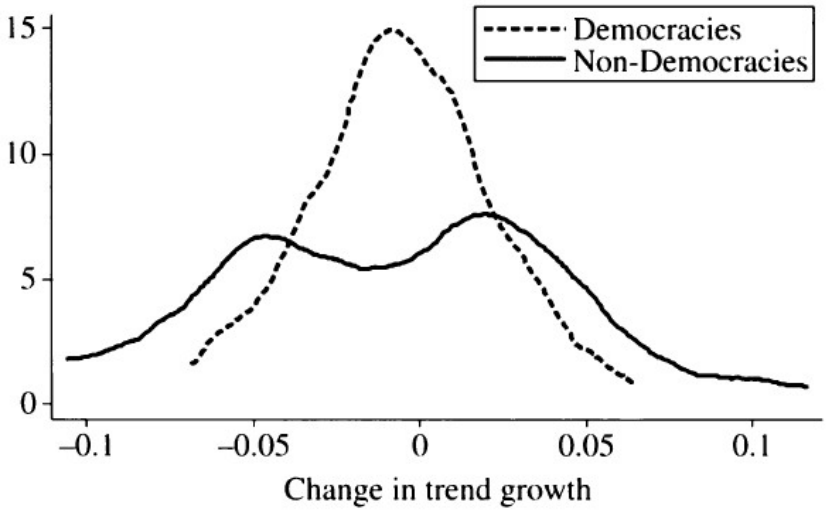


FIGURE III.2 KERNEL DENSITY OF CHANGES IN TREND-GROWTH[206]

III.3 ACCUMULATION OF HUMAN CAPITAL CHANNEL EFFECT

Another important aspect to consider is human capital. Democracy, according to the literature, promotes the accumulation and the development of human capital. This increase in both quantity and quality is the channel that democracy uses to foster economic growth.

The first scholars to study this link were Tavares and Wacziarg in their seminar work *How democracy affects growth*[207]. In this study, the authors, have found conclusive proof that democracy through the promotion of human capital

[206] Figure taken from CUBERES D., JERZMANOWSKI M., *Democracy, diversification and growth reversals*, The Economic Journal, 119,1270-1302, 2009.
[207] TAVARES J., WACZIARG R., *How democracy affects growth*, European Economic Review, 45, 2001, 1341-1378.

accumulation, positively affects economic growth. To demonstrate this point, they have developed a model based on various data from the 1970-1989 period for 65 countries, both developed and developing countries. To fully understand the impact of democracy on human capital accumulation, and how this consequently influences growth, the results are divided in three distinct columns as shown in the figure below.

TABLE III.3 THE HUMAN CAPITAL CHANNEL[208]

Channel	Effect of democracy on the channel	Effect of the channel on growth	Effect of democracy on growth
Human capital	0.4363 (3.88)	0.5669 (3.60)	0.2474 (2.61)

On the first column the coefficient represents the effect of democracy on the accumulation of human capital, while the second column describes how this accumulation affects growth. The last column indicates the overall effect that democracy has on growth through the human capital channel. The coefficient reported here is obtained multiplying the first and the second coefficients.

As shown in the figure, democracy does increase the accumulation of human capital. Usually, this increase is developed through a higher education attainment. Moreover, it is shown, as predicted by the vast literature on economic growth,

[208] Table taken from TAVARES J., WACZIARG R., *How democracy affects growth*, European Economic Review, 45, 2001, 1341-1378.

human capital is essential for growth. Finally, thanks to this model, it is possible to quantify the overall effect of democracy on growth through the channel effect of human capital. The value of the coefficient suggests that 25% of the growth caused by democracy, passes through the human capital channel.

Once the overall human capital channel effect was introduced, more detailed studies have been conducted on the topic. Most relevant for this thesis is the work of Saha and Zhang[209], that have investigated, through a cross-national analysis, how this channel effect operates in distinct environments. In their study, the concept of human capital is broader than the one used in Tavares and Wacziarg. It encompasses life expectancy at birth, educational attainment, and income per capita GDP, and it is measured with the composite index "human development index" (HDI) published by the United Nations Development Programme report. Using this index, the authors want to understand the effect of democracy on the well-being of people, and indirectly the democratic effect on growth. To do so they have developed the following model:

$$HDI_{i,t} = \alpha_1 + \alpha_2 DEMO_{i,t} + \alpha_3 RGDPPCg_{i,t} + \alpha_4 DEMO*RGDPPCg_{i,t} + \alpha_5 CONTROL_{i,t} + \varepsilon_{i,t}$$

where together with democracy as independent variable, have been added growth of per capita GDP and the interaction term between democracy and growth as

[209] SAHA S., ZHANG Z., *Democracy-growth nexus and its interaction effect on human development: a cross-country analysis*, Economic Modelling, 63, 2017, 304-310.

control. Using data from 170 countries from 1980 to 2010, they have come with the empirical proof that democracy does promote human capital development with an increase of HDI of 3.7%[210].

After having demonstrated the general level of this effect, a more in-dept analysis has been conducted. First, the countries of the panel have been divided in developing and developed countries. Using this distinction, the authors have again estimated the effects on both sub-groups.

[210] The coefficient's value of 3.7% is quite small compared to the coefficient found in Tavares, but it must be considered that the human development index encompasses more aspects, so that a smaller value is to be expected.

TABLE III.4 DEMOCRACY EFFECT ON HUMAN CAPITAL IN DEVELOPED AND DEVELOPING COUNTRIES[211]

	Developing countries PLS				Developed countries PLS			
	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RGDPPCg	0.122***	0.104***	0.190***	0.665***	−0.021***	−0.015***	−0.084**	−0.037
	(7.185)	(2.822)	(3.823)	(2.865)	(4.207)	(3.130)	(1.959)	(0.389)
lnGS	−0.037***	−0.056***	−0.036***	−0.057***	0.021***	0.009	0.020***	0.009
	(6.653)	(9.322)	(6.646)	(9.124)	(2.560)	(1.490)	(2.747)	(1.513)
lnOpen	0.079***	0.071***	0.079***	0.069***	0.019***	0.033***	0.019***	0.033***
	(7.909)	(8.483)	(8.003)	(8.164)	(0.005)	(5.074)	(3.946)	(5.129)
DEMOF	0.020***		0.021***		0.015***		0.014***	
	(8.960)		(9.907)		(12.911)		(14.094)	
DEMOP4		0.029***		0.030***		0.022***		0.022***
		(6.832)		(8.252)		(15.224)		(19.871)
DEMOF*RGDPPCg			−0.021**				0.007	
			(1.996)				(1.450)	
DEMOP4*RGDPPCg				−0.076***				0.002
				(2.740)				(0.228)
Constant	0.194***	0.154***	0.190***	0.158***	0.562***	0.451***	0.566***	0.453***
	(7.956)	(8.611)	(7.750)	(8.833)	(11.570)	(8.923)	(12.477)	(9.591)
Adjusted R^2	0.250	0.269	0.250	0.283	0.333	0.312	0.332	0.309
Wald test (*p*-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	663	619	663	619	259	238	259	238
Countries	129	115	129	115	43	39	43	39

What emerges is that both in developed and developing countries the democratic effect is significant and positive but in developing countries the effect is slightly higher with a coefficient of 2% compared to 1.5% of the developed countries sub-groups. An interesting conclusion that can be drown from this estimation is that appears to be convergence over time of the HDI index thanks to the influence of democracy.

Finally, to understand how and if the channel effect works in transition countries where the political regime is shifting towards a more democratic one, the authors have divided the countries pool in three sub-groups: autocratic countries, transition countries, and democratic countries. Running the model, they have been

[211] Table taken form SAHA S., ZHANG Z., *Democracy-growth nexus and its interaction effect on human development: a cross-country analysis*, Economic Modelling, 63, 2017, 304-310.

able to empirically demonstrate that democracy is important in the development of human capital in both transition countries and democratic countries while, increasing democracy in autocratic countries leads, at least in the first moments, to a decrease of the overall well-being of the population.

TABLE III.5 DEMOCRACY EFFECT ON HDI ACROSS POLITICAL REGIMES[212]

	Autocratic countries		Transition countries		Democratic countries	
	(15)	(16)	(17)	(18)	(19)	(20)
RGDPPCg	0.255*	0.268	0.155*	0.578**	0.003	0.061
	(1.772)	(1.105)	(1.887)	(2.366)	(0.173)	(1.018)
lnGS	−0.066***	−0.066***	−0.079***	−0.078***	−0.043***	−0.042***
	(3.291)	(3.281)	(6.109)	(6.049)	(2.680)	(2.567)
lnOpen	0.076***	0.076***	0.089***	0.088***	0.0002	−1.12E-05
	(3.784)	(3.771)	(7.016)	(6.900)	(0.022)	(0.001)
DEMOF	−0.017*	−0.017*	0.028***	0.028***	0.044***	0.044***
	(1.751)	(1.730)	(6.579)	(6.522)	(18.729)	(18.636)
DEMOF*RGDPPCg		−0.007		−0.083***		−0.007
		(0.069)		(1.837)		(1.014)
Constant	0.385***	0.385***	0.175***	0.182***	0.475***	0.469***
	(3.465)	(3.452)	(2.965)	(3.091)	(9.475)	(9.295)
Adjusted R^2	0.178	0.173	0.370	0.375	0.497	0.497
Wald test (*p*-value)	0.000	0.000	0.000	0.000	0.000	0.000
Observations	187	187	293	293	377	377
Countries	40	40	54	54	61	61

The efficiency of democracy in increasing human capital has been demonstrated also by Hellmanzik[213] in a very unconventional way. The author has started from the analysis of the art market for 273 major visual artists from 1800 and 1945 in relation to political regimes all around the world. In their findings, what emerges is that democracy does influence the value of the art. Starting from the belief that what drives most the price of art is the intrinsic quality, it easy to assume that

[212] Table taken form SAHA S., ZHANG Z., *Democracy-growth nexus and its interaction effect on human development: a cross-country analysis*, Economic Modelling, 63, 2017, 304-310.
[213] HELLMANZIK C., *Democracy and economic outcomes: evidence from the superstars of modern art*, European Journal of Political Economy, 30, 2013, 58-69.

visual art done in democratic settings is more creative and "stronger" than art developed under an autocratic regime.

TABLE III.6 DEMOCRACY PROMOTER OF HIGHER QUALITY ART[214]

	(1)	(2)	(3)	(4)	(5)	(6)
Log (Price)	overall	overall	overall	overall	before 1939	after 1945
Polity	0.011	0.017	0.020	0.021	0.041	0.019
	[0.003]***	[0.004]***	[0.005]***	[0.005]***	[0.005]***	[0.010]*
GDP growth (3 year window)			−1.009	−1.165	0.123	−0.557
			[0.264]***	[0.256]***	[0.275]	[0.711]
Log (GDP per capita)			−0.038	−0.091	0.389	0.179
			[0.152]	[0.143]	[0.310]	[0.346]
Share of urban population			0.936	1.086	3.526	1.021
			[0.702]	[0.692]	[1.503]**	[0.508]*
Energy consumption p.c.			0.000	0.000	0.000	0.000
			[0.000]	[0.000]	[0.000]	[0.000]
Trend			−0.217	−0.150	−0.282	−0.176
			[0.052]***	[0.055]**	[0.027]***	[0.329]
Openness				0.681		
				[0.459]		
Age	0.580	0.548	0.571	0.445	0.941	0.376
	[0.062]***	[0.048]***	[0.056]***	[0.078]***	[0.078]***	[0.326]
Age 2	−0.011	−0.010	−0.010	−0.009	−0.021	−0.007
	[0.003]***	[0.002]***	[0.002]***	[0.003]***	[0.002]***	[0.006]
Age 3	0.000	0.000	0.000	0.000	0.000	0.000
	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]
Age 4	0.000	0.000	0.000	0.000	0.000	0.000
	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]
Log (size)	0.616	0.613	0.610	0.610	0.691	0.584
	[0.028]***	[0.028]***	[0.029]***	[0.030]***	[0.035]***	[0.018]***
Oil	0.308	0.312	0.295	0.291	0.371	0.247
	[0.102]***	[0.100]***	[0.098]***	[0.100]***	[0.079]***	[0.105]**
Canvas	0.304	0.310	0.319	0.320	0.133	0.507
	[0.078]***	[0.078]***	[0.085]***	[0.091]***	[0.025]***	[0.104]***
Country fixed effects	no	yes	yes	yes	yes	yes
Time fixed effects	yes	yes	yes	yes	yes	yes
Artists fixed effects	yes	yes	yes	yes	yes	yes
Year of sale dummy	yes	yes	yes	yes	yes	yes
Observations	34,726	34,726	34,106	32,446	16,270	16,161
R-squared	0.70	0.71	0.71	0.71	0.69	0.76

As shown in the first row of the figure, one point increase in the democracy variable is responsible to a 2% increase in the value of art. From this is possible to say that democratic regimes, where civil liberties are respected and there are free information flows, are the best environment to support creative production.

[214] Table taken from HELLMANZIK C., *Democracy and economic outcomes: evidence from the superstars of modern art*, European Journal of Political Economy, 30, 2013, 58-69.

III.4 **INNOVATION CHANNEL EFFECT**

These last aspects are essential also for technological innovation, another fundamental channel that democracy uses to foster economic growth.

In the whole literature, technological change and innovation is considered to be the most important factor in economic development[215]. It has been proved, by using different approaches that democracy does promote innovation. One is the one used by Knutsen in *Why democracies outgrow autocracies in the long run: civil liberties, information flows and technological change*[216]. Here the author, using Total factor productivity (TFP) as proxy for innovation, has demonstrated that democracy positively influences innovation. The quantitative value of this relationship is around 3.5%, according to the results reported below.

[215] Starting from the introduction of the Cobb-Douglas production function in the 1930s.
[216] KNUTSEN C. H., *Why democracies outgrow autocracies in the long run: civil liberties, information flows and technological change*, KYKLOS, 68, 2015, 357-384.

TABLE III.7 DEMOCRACY EFFECT ON INNOVATION[217]

	I (OLS PCSE) *b/(t)*	II (FE) *b/(t)*	III (RE2SLS) *b/(t)*	IV (FE2SLS) *b/(t)*	V (OLS PCSE) *b/(t)*	VI (FE2SLS) *b/(t)*
Polity Index	0.034***	0.039***	0.030**	0.026*	0.047***	0.045***
	(3.84)	(5.98)	(2.08)	(1.77)	(9.58)	(4.17)
Ln TFP	-1.828***	-3.195***	-1.966***	-2.551***	-0.882***	-1.002***
	(-3.08)	(-20.14)	(-12.68)	(-15.02)	(-11.40)	(-15.46)
Ln population	-0.170**	-2.532***	-0.724***	-2.247***	-0.0053	-0.225***
	(-2.07)	(-17.26)	(-8.20)	(-14.95)	(-0.24)	(-4.64)
Global Frontier TFP growth	-0.022	-0.083	-0.051	-0.095	-0.031	-0.122**
	(-0.37)	(-1.29)	(-0.78)	(-0.72)	(-1.91)	(-2.45)
Ethnic Fractionalization	-0.589		-1.885***		-1.372***	
	(-1.22)		(-2.94)		(-9.95)	
East Europe-Soviet Union	-2.970***		-0.780		-0.635***	
	(-4.61)		(-1.21)		(-4.70)	
Sub-Saharan Africa	-2.489***		-2.996***		-0.719***	
	(-4.26)		(-5.37)		(5.29)	
Asia	-1.308***		-1.037**		-1.041***	
	(-2.58)		(-2.09)		(-8.64)	
Middle East – North Africa	-0.228		-0.871		-0.332***	
	(-0.53)		(-1.63)		(-2.89)	
Latin America	-0.991**		-1.963***		-0.268***	
	(-2.10)		(-4.23)		(-2.76)	
Country dummies		Y		Y		Y
Decade dummies	Y	Y	Y	Y	Y	Y
N	6877	6877	5826	5826	15191	15191
Countries	138	138	119	119	184	184
Imputed data					Y	Y

Like for the artistic world, essential to the innovation process is the ability to be creative. According to the author, democracy represent the best environment for these activities because under democratic regime civil liberties are respected, information is freer to flow, and innovative technologies are more rapidly adopted.

[217] Table taken from KNUTSEN C. H., *Why democracies outgrow autocracies in the long run: civil liberties, information flows and technological change*, KYKLOS, 68, 2015, 357-384.

For those exact same reasons, democracy appears to have in the manufacturing sector a technologically conditioned effect. According to Zuazu[218], democracy, promoting a more unrestricted economic and social environment, favours the development and the growth of manufacturing industries that are nearer the World technological frontier (WTF), so more advanced industries, while appears to slow down the development of more backward manufacturing industries. Below are reported the results from the model created to empirically demonstrate this hypothesis, based on data from 61 manufacturing industries from 76 countries between 1990 and 2010.

[218] ZUAZU I., *The growth effect of democracy and technology: an industry disaggregated approach*, European Journal of Political Economy, 56, 2019, 115-131.

TABLE III.8 TECHNOLOGICALLY CONDITIONED DEMOCRACY EFFECT ON MANUFACTURING[219]

Dependent variable: manufacturing industries output growth rate				
	(1) SVMDI	(2) SVMDI	(3) SVMDI	(4) SVMDI
Distance from the WTF	1.766***	2.612***	2.360***	3.413***
	(0.113)	(0.243)	(0.271)	(0.319)
Democracy	0.152***	0.478***	0.454***	0.984***
	(0.048)	(0.083)	(0.089)	(0.115)
Interaction (Dist*Demo)		−1.320***	−1.452***	−2.772***
		(0.293)	(0.316)	(0.374)
Output share			−4.226***	−5.099***
			(0.525)	(1.028)
Employment			−32.640**	−32.014
			(13.229)	(24.267)
Establishments			−39.226	−33.403
			(91.052)	(98.306)
GDP per capita growth rate				0.096
				(0.193)
Openness				0.001
				(0.001)
Real exchange rate				−0.079***
				(0.023)
Regulation (Area 5 EFW)				−0.016
				(0.011)
Population (ln)				−0.194
				(0.172)
Human capital				−0.073**
				(0.036)
Age of democracy				0.000
				(0.008)
Constant	−0.002	−0.264***	−0.039	3.183
	(0.040)	(0.070)	(0.078)	(2.890)
N of Obs.	32,550	32,550	26,974	14,037
N of Groups	3267	3267	2732	2342
Within -R^2	0.573	0.574	0.600	0.634

Analysing the results of column four where the most complete model is reported, it is possible to note the positive effect of democracy on the output growth rate. To better understand the role of democracy, the author has also introduced the interaction term of democracy with distance from the world technological frontier. Here, the coefficient for this variable is significant and negative, to confirm the conditionality of the democratic effect regarding the technological position of the manufacturing industries.

To better grasp the implication of this result, it is useful to analyse the marginal effect of democracy upon distance from WTF.

[219] Table taken from ZUAZU I., *The growth effect of democracy and technology: an industry disaggregated approach*, European Journal of Political Economy, 56, 2019, 115-131.

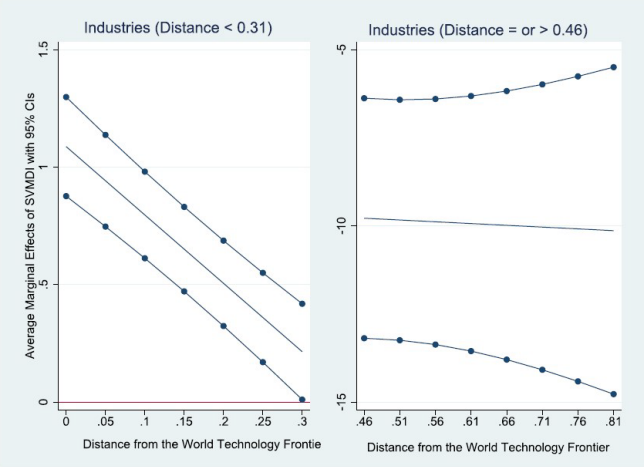


FIGURE III.3 MARGINAL EFFECT OF DEMOCRACY UPON DISTANCE FROM WTF[220]

Just looking at the figures it is possible to note how different the democracy effect is between more advanced manufacturing industries and more backward manufacturing industries. For the former the values are all positive and decreasing following the increase of the distance from the WTF while for the latter values are always negative.

In the last pages of this chapter, it has been discussed the importance of the human capital accumulation and of innovation as channels through democracy can foster economic growth. To close this part is important to consider another important

[220] Figure taken from ZUAZU I., *The growth effect of democracy and technology: an industry disaggregated approach*, European Journal of Political Economy, 56, 2019, 115-131.

channel effect, that, even if has strong support in the scientific community, it is less easily quantifiable: democracy as promoter of better institutions.

III.5 **BETTER INSTITUTIONS CHANNEL EFFECT**

In literature, democracy is often associated with higher quality of institutions. What matters most for the economic development are those that directly or indirectly promote growth. One of the most famous exponents of this school of thought is Rodrik. Especially in his *Institutions for high quality growth: what they are and how to acquire them*[221], he has enlisted a series of institutions that are essential for sustainable and long-term growth. According to him, an economy to really flourish needs in the background an institutional system that guarantees certainty and that allows the market economy to function properly. Before going deeper in Rodrik's analysis, it is imperative to recognise the influence of North and his "institutionalism". In his revolutionary work *The role of institutions in economic development*[222] he has highlighted the fundamental role of non-market institutions for economic development. The ideas putted forward in this paper are so important that several scholars have begun to refer to the author's ideas with the name "institutionalism".

[221] RODRIK D., *Institutions for High-Quality Growth: What they are and how to acquire them*, Studies in Comparative International Development, 35, 2000, 3-31.
[222] NORTH D. C., *The role of institutions in economic development*, Discussion paper series, United Nations, 2003.

Clearly influence by North, Rodrik enlisted five non-market institutions as conduits of better economic performance: propriety rights, regulatory institutions, institutions for macroeconomic stability, institutions for social insurance, and institutions of conflict management[223]. All contribute, as necessary aspects, to the development of an economic and social system where the economy can flourish thanks to the stability and certainty infused in the system that allow every economic actor to better perform. Democracy as a participatory institution that guarantees fairness and less cronyism, while promoting innovation and more high-quality human capital, is the most efficient and better suited political system to establish and maintain those essential institutions[224].

The institutions described above have been also considered by Acemoglu et al. in *Democracy does cause growth*[225]. Here the authors, after having demonstrated the positive democracy effect on growth, as previously explained, have introduced some institutional channel that democracy uses to foster growth. The institutional approach is quite strong even if with a slightly different approach than Rodrik. While the latter have talked about institutions for conflict management, in this paper the authors directly refer to reduction of social unrest. Moreover, while

[223] Aspect already cited previously in this chapter.
[224] North highlights also how to really make institutions work, it is not sufficient to establish them passing laws and regulations, but it is absolutely necessary that those institutions are recognised and the laws behind them are enforced.
[225] ACEMOGLU D., NAIDU S., RESTREPO P., ROBINSON J. A., *Democracy does cause growth*, Journal of Political economy, 127, 2019, 47-100.

Rodrik have putted emphasis on background institutions that crate the perfect environment for the market, Acemoglu et al. clearly talk about economic freedom. In the end, even if slightly distinct approaches have been used, the underlying theory is the same, democracy does cause growth, through the channel of non-market institutions, backbone of every efficient market economy.

III.6 **CONCLUSIVE REMARKS**

In this chapter have been discussed the most important channels used by democracy to indirectly foster growth. Stability, accumulation of human capital, and innovation have been evaluated from a more technical and quantitative standpoint thanks to a well-developed scientific literature, while the better institutions channel has been treated more in qualitative way, as done in most of the literature, due to the difficulty in accurately quantify this phenomenon.

CONCLUSION

Democracy with is history longer than two millennia is still the best political regime or, as Churchill once reportedly said "*Democracy is the worst form of Government except for all those other forms that have been tried from time to time*"

Today, around the world, democracy can assume different forms, to better suit the culture and the needs of each population willing to adopt it. Nevertheless, some essential features are common to all democracies worldwide. They represent the will of the people beneath them, they are expression of the people needs, and they are responsible for taking decisions for the greater good while protecting the rights of the minority.

No democracy is perfect, otherwise all the indexes explained in the first chapter of this work would be pointless, even if, as for all human sciences, maybe no one-fit-all scheme really exists. To notice this, just consider how many types of democratic regimes do exist worldwide: presidential democracy, semi-presidential democracy, parliamentary democracy and so on. The only aspect that really matters is, as explained before, the ability of the regime to really represent all its citizens, in all contexts from internal to external in the world stage.

Having shown the fundamental role played in each place where democracy is implemented, not only in the development and growth of the economic system but also in promoting stability, innovation, and accumulation and advancement of human capital, it is now clear how important is this form of political regime for the future of the world. Democracy is the only way of government that promotes growth directly and indirectly while guaranteeing rights and providing possibilities for all citizens. Some autocratic states, see primarily China and Singapore, are having economic success but the social and human costs imposed by those regimes on ordinary citizens are overwhelming. Singaporean citizens, since the 1970s have never had the chance to vote for their government. Yet, the population that is paying the higher price is certainly the Chinese one. Millions of people, since the China opening to the world, have surely improved their standard of living, most of them exiting from poverty but the priced paid has been high. With the improvement of well-being of most of the citizens, and with more openness to the world, freedom is all its form has begun to be desired. Since the autocratic Chinese regime is based on strong state control, freedom is not a top priority of the Chinese government, to say the least. So that, in the last years, especially under president Xi, ordinary Chinese people are experiencing a return of extensive state control and surveillance on every aspect of their personal life[226].

[226] Fate even worse has been experienced by the Uyghurs, an Islamic ethnic group, in the Xinjiang

Even if democratic regimes are best suited to foster both social and economic aspects for all, as said in the introduction, nowadays democracy is under siege. The impact of two of the greatest external shocks registered in the last seventy years, the covid-19 pandemic, and the recent Russian invasion of Ukraine, is threatening the survival of several democracies around the world. Even though, as discussed in chapter two, pluralistic institutions are the most efficient in adsorbing external shocks, citizens worldwide are becoming ever more disenchanted with democratic ideals. Rapid and easy solutions, often demagogic and extremely dangerous in the long term, are offered by strong men, supported by other strong men that are experiencing some short-term successes. To further complicate this already precarious situation, the slow of the global economy, started with the financial crisis of 2007-2009, principally perceived by citizens of the democratic Western world, needs to be considered. Losing in the economic battlefield to authoritarian states [227], has contributed to the process of delegitimating the democratic regimes, occurring especially in the eyes of average citizens around the world. Autocracies and strong men appear to be faster and wiser in proposing

region. This groups have been systematically persecuted by Chinese authority, often in open violation of human right, due to their different culture that does not fit in the Han common culture. These differences are seen by the central government as dangerous to the uniform
Culture that the central government is trying to promote all around China.

[227] It is important to always keep in mind that often the economic results published by authoritarian states are not realistic, being inflated artificially as shown in MAGEE C. S. P., DOCES J. A., *Reconsidering regime type and growth: Lies, dictatorship, and statistics*, International Studies Quarterly, 59, 2015, 223-237. Here, the authors have demonstrated that on average, data from autocratic states is inflated by 0.5% to 1.5%.

solutions and in “getting things done” while democracies appear to be always in the process of compromise and negotiate without offering any real solution. This aspect is particularly troubling also when this topic is analysed from an economic point of view. In the main part of this thesis, one of the main points proved is that democracy and democratization are conduit of economic growth. Consequently, also the opposite must be true: losing democratic standards means losing economic growth or worse entering in periods of negative growth. One relevant example of this inverse process is Myanmar. In the last decades, Myanmar has experienced after several years of civil wars and uncertainty, a more pacific period, where democracy, even if not perfect, was arising fostering economic development and growth. The critical point is the 1st of February 2021 when the army organised a golpe, relieving the democratic institutions of their powers, while they established a military golpe. From an economic standpoint, while the Myanmar GDP was increasing up to the 2020, the GDP evaluated for the 2021 shows a quite substantial decrease. According to the Asian Development Outlook 2022 published by the Asian Development Bank, the GDP of Myanmar in 2021 has decreased by 18.4%. Only time will tell how damaging the army dictatorship will be to the Birmans people and economy.

For the future of the world, it is essential that democracies worldwide find new ways to regain legitimacy and strength. Without being legit at the average

citizen’s eyes, democracy cannot express all its potential, contributing to the vicious circle already started in which showing little results, it continues to lose the people support in favour of more charismatic yet extremely dangerous men.

Democracy, as a vector of development for all, with all the social and economic benefits that it brings, is not an opportunity to be missed. Only through democratic regimes, real and sustainable development can be achieved in all the regions of the world. This is the key for a better future for all.

APPENDIX A

Complete table of democratic results for 159 countries in 2018.

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Afghanistan	-1	11	0.367	2.97	3.74	0.721
Albania	9	6	0.519	5.98	29.07	0.948
Algeria	2	11	0.305	3.5	8.98	0.456
Angola	-2	12	0.37	3.62	4.82	0.364
Argentina	9	4	0.819	7.02	39.36	0.980
Armenia	7	9	0.493	4.79	20.57	0.821
Australia	10	2	0.864	9.09	91.73	0.970
Austria	10	2	0.79	8.29	95.84	0.990
Azerbaijan	-7	13	0.197	2.65	3.28	0.079
Bahrain	-10	13	0.125	2.71	5.18	0.045
Bangladesh	-6	8	0.341	5.57	19.10	0.204
Belarus	-7	12	0.28	3.13	5.65	0.347
Belgium	8	2	0.866	7.78	84.04	0.953
Benin	7	4	0.654	5.74	31.22	0.961
Bhutan	7	7	0.603	5.3	38.06	0.902
Bolivia	7	6	0.641	5.7	17.83	0.800
Botswana	8	5	0.697	7.81	47.50	0.926
Brazil	8	4	0.742	6.97	39.19	0.980
Bulgaria	9	4	0.593	7.03	42.65	0.983
Burkina Faso	6	7	0.739	4.75	24.88	0.805
Burundi	-1	13	0.179	2.33	1.57	0.065
Cabo Verde	10	2	0.769	7.88	62.85	0.892
Cambodia	-4	11	0.254	3.59	6.88	0.172
Cameroon	-4	12	0.334	3.28	4.71	0.111
Canada	10	2	0.85	9.15	92.67	0.997
Central African Republic	6	14	0.42	1.52	0.00	0.716
Chad	-2	13	0.29	1.61	1.93	0.209
Chile	10	2	0.852	7.97	77.57	0.970
China	-7	13	0.09	3.32	4.01	0.023
Colombia	7	6	0.664	6.96	29.02	0.884

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Comoros	-3	7	0.495	3.71	16.58	0.835
Congo (Brazzaville)	-4	12	0.28	3.31	4.63	0.097
Congo (Kinshasa)	-3	13	0.3	1.49	1.03	0.701
Costa Rica	10	2	0.896	8.07	63.69	0.986
Cote d'Ivoire	4	8	0.65	4.15	19.84	0.431
Croatia	9	3	0.689	6.57	55.71	0.937
Cuba	-5	13	0.182	3	3.56	0.007
Cyprus	10	2	0.846	7.59	69.88	0.981
Czech Republic	9	2	0.822	7.69	76.73	0.985
Denmark	10	2	0.888	9.22	94.00	0.979
Djibouti	3	11	0.267	2.87	7.98	0.220
Dominican Republic	7	6	0.602	6.54	29.43	0.968
Ecuador	5	6	0.673	6.27	25.50	0.940
Egypt	-4	12	0.211	3.36	7.23	0.059
El Salvador	8	5	0.672	5.96	25.51	0.914
Equatorial Guinea	-6	14	0.182	1.92	0.00	0.018
Eritrea	-7	14	0.086	2.37	0.00	0.035
Estonia	9	2	0.901	7.97	80.95	0.990
Ethiopia	1	13	0.287	3.35	3.59	0.181
Fiji	4	6	0.511	5.85	33.11	0.935
Finland	10	2	0.855	9.14	100.00	0.992
France	9	3	0.85	7.8	78.24	0.991
Gabon	3	12	0.411	3.61	6.13	0.722
Gambia	4	9	0.566	4.31	17.91	0.778
Georgia	7	6	0.676	5.5	40.14	0.978
Germany	10	2	0.838	8.68	89.83	0.986
Ghana	8	3	0.648	6.63	49.89	0.962
Greece	10	4	0.831	7.29	46.61	0.991
Guatemala	8	8	0.553	5.6	14.62	0.909
Guinea	4	10	0.41	3.14	8.44	0.610
Guinea-Bissau	6	10	0.497	1.98	8.26	0.824
Guyana	7	5	0.6	6.67	33.22	0.958
Haiti	5	10	0.423	4.91	9.62	0.387
Honduras	7	8	0.392	5.63	14.70	0.872
Hungary	10	5	0.536	6.63	49.53	0.809

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
India	9	5	0.557	7.23	40.01	0.867
Indonesia	9	6	0.6	6.39	30.40	0.985
Iran	-7	12	0.205	2.45	6.17	0.504
Iraq	6	11	0.422	4.06	3.23	0.715
Ireland	10	2	0.846	9.15	85.71	0.988
Israel	6	4	0.698	7.79	62.79	0.941
Italy	10	2	0.873	7.71	58.87	0.992
Jamaica	9	5	0.807	7.02	35.62	0.941
Japan	10	2	0.808	7.99	87.61	0.906
Jordan	-3	10	0.271	3.93	19.34	0.147
Kazakhstan	-6	12	0.239	2.94	7.17	0.131
Kenya	9	8	0.447	5.11	21.71	0.859
Kuwait	-7	10	0.321	3.85	19.18	0.057
Kyrgyzstan	8	10	0.511	5.11	10.74	0.852
Laos	-7	13	0.12	2.37	2.81	0.021
Latvia	8	4	0.846	7.38	62.09	0.967
Lebanon	6	10	0.482	4.63	11.55	0.738
Lesotho	8	6	0.568	6.64	30.11	0.881
Liberia	7	6	0.595	5.35	20.19	0.940
Lithuania	10	2	0.803	7.5	74.51	0.909
Luxembourg	10	2	0.874	8.81	93.90	0.955
Madagascar	6	7	0.491	5.22	20.00	0.783
Malawi	6	6	0.555	5.49	29.45	0.925
Malaysia	7	8	0.372	6.88	33.46	0.870
Mali	5	9	0.512	5.41	14.44	0.524
Mauritania	-2	11	0.406	3.82	9.31	0.370
Mauritius	10	3	0.825	8.22	64.58	0.950
Mexico	8	6	0.719	6.19	25.54	0.959
Moldova	9	6	0.575	5.85	28.94	0.975
Mongolia	10	3	0.624	6.5	42.80	0.982
Montenegro	9	6	0.456	5.74	36.69	0.922
Morocco	-4	10	0.299	4.99	16.54	0.554
Mozambique	5	8	0.477	3.85	14.55	0.685
Myanmar	8	10	0.36	3.83	9.77	0.735
Namibia	6	4	0.688	6.25	49.34	0.617

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Nepal	7	7	0.607	5.18	24.45	0.908
Netherlands	10	2	0.861	8.89	93.35	0.957
New Zealand	10	2	0.873	9.26	95.39	0.991
Nicaragua	6	9	0.229	3.63	11.98	0.181
Niger	5	8	0.583	3.76	19.81	0.761
Nigeria	7	8	0.577	4.44	16.39	0.741
North Korea	-10	14	0.092	1.08	0.00	0.044
North Macedonia	9	7	0.557	5.87	27.52	0.938
Norway	10	2	0.913	9.87	97.42	0.983
Oman	-8	11	0.188	3.04	15.83	0.013
Pakistan	7	9	0.415	4.17	15.61	0.761
Panama	9	4	0.788	7.05	42.23	0.971
Papua New Guinea	5	6	0.444	6.03	23.53	0.868
Paraguay	9	6	0.617	6.24	27.25	0.948
Peru	9	5	0.753	6.6	30.56	0.961
Philippines	8	6	0.525	6.71	27.98	0.820
Poland	10	3	0.708	6.67	57.12	0.929
Portugal	10	2	0.874	7.84	78.72	0.985
Qatar	-10	11	0.094	3.19	17.36	0.013
Romania	9	4	0.628	6.38	50.78	0.958
Russia	4	13	0.285	2.94	2.92	0.363
Rwanda	-3	12	0.26	3.35	9.24	0.086
Saudi Arabia	-10	14	0.028	1.93	0.00	0.021
Senegal	7	4	0.733	6.15	40.05	0.800
Serbia	8	5	0.394	6.41	36.43	0.825
Sierra Leone	7	6	0.586	4.66	23.56	0.918
Singapore	-2	8	0.397	6.38	47.34	0.348
Slovakia	10	2	0.824	7.1	64.17	0.960
Slovenia	10	2	0.824	7.5	76.81	0.965
South Africa	9	4	0.717	7.24	42.03	0.857
South Korea	8	4	0.867	8	67.38	0.988
Spain	10	2	0.819	8.08	75.78	0.985
Sri Lanka	6	7	0.644	6.19	31.12	0.965
Sudan	-4	14	0.281	2.15	0.00	0.036
Suriname	5	4	0.772	6.98	42.76	0.997

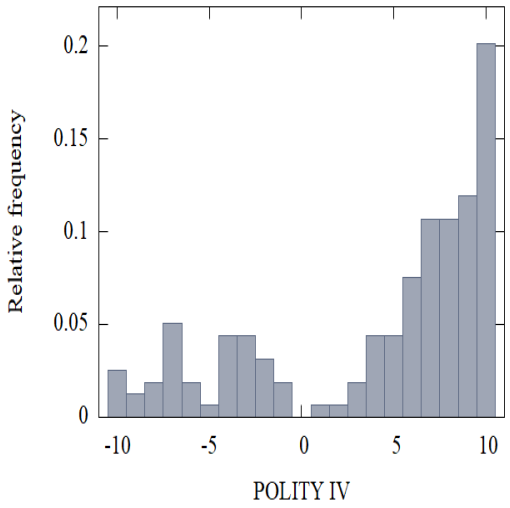
COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Sweden	10	2	0.903	9.39	94.25	0.965
Switzerland	10	2	0.881	9.03	96.64	0.959
Syria	-9	14	0.152	1.43	0.00	0.019
Taiwan	10	2	0.801	7.73	78.03	0.987
Tajikistan	-3	13	0.174	1.93	1.98	0.066
Tanzania	3	8	0.504	5.41	20.09	0.746
Thailand	-3	11	0.16	4.63	13.32	0.049
Timor-Leste	8	5	0.755	7.19	20.36	0.966
Togo	-2	8	0.441	3.1	19.69	0.367
Trinidad and Tobago	10	4	0.786	7.16	41.70	0.975
Tunisia	7	5	0.743	6.41	40.23	0.912
Turkey	-4	11	0.349	4.37	11.39	0.339
Turkmenistan	-8	14	0.16	1.72	0.00	0.052
Uganda	-1	10	0.375	5.2	15.37	0.358
Ukraine	4	6	0.408	5.69	24.33	0.832
United Arab Emirates	-8	13	0.115	2.76	5.92	0.000
United Kingdom	8	2	0.875	8.53	90.07	0.989
United States of America	8	3	0.834	7.96	79.90	0.967
Uruguay	10	2	0.884	8.38	66.24	0.981
Uzbekistan	-9	14	0.204	2.01	0.00	0.043
Venezuela	-3	11	0.241	3.16	0.00	0.285
Vietnam	-7	12	0.224	3.08	8.78	0.048
Zambia	6	8	0.348	5.61	22.46	0.812
Zimbabwe	4	11	0.329	3.16	5.96	0.507

SUMMARY STATISTICS OF SINGULAR INDEXES

In the next pages are reported summary statistics and relative frequency for all the selected indexes. All the statistics and the figures are obtained using the econometric software "Gretl".

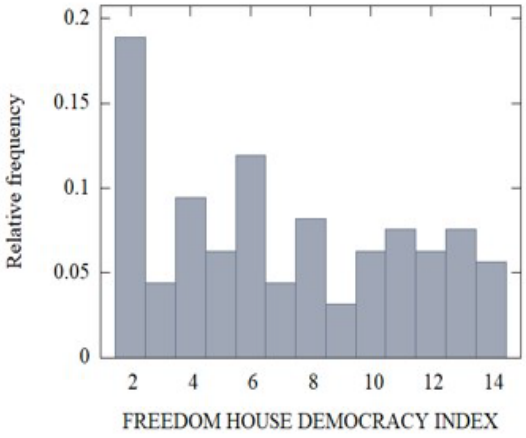
Summary Statistics and Relative Frequency, using the observations 1 – 159 for the variable POLITY IV

Mean	4.2138
Median	7
Minimum	-10
Maximum	10
Std. Dev.	6.1955
C.V.	1.4703
Skewness	-0.9442
Ex. kurtosis	-0.5425
5% Perc.	-8
95% Perc.	10
IQ range	11
Missing obs.	0



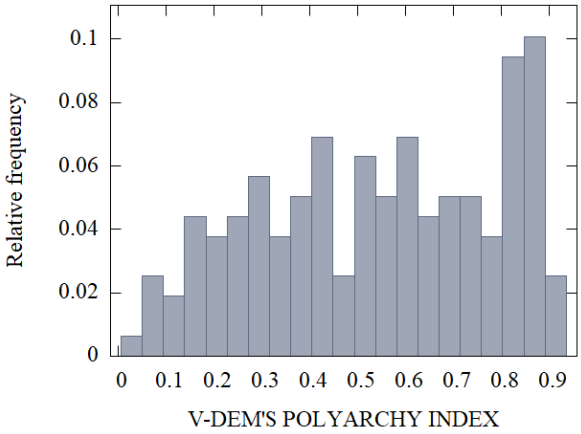
Summary statistics and Relative Frequency, using the observations 1 – 159 for the variable FREEDOM HOUSE DEMOCRACY INDEX

Mean	7.1509
Median	6
Minimum	2
Maximum	14
Standard deviation	3.9701
C.V.	0.55519
Skewness	0.22217
Ex. Kurtosis	-1.2654
5% percentile	2
95% percentile	14
Interquartile range	7
Missing obs.	0



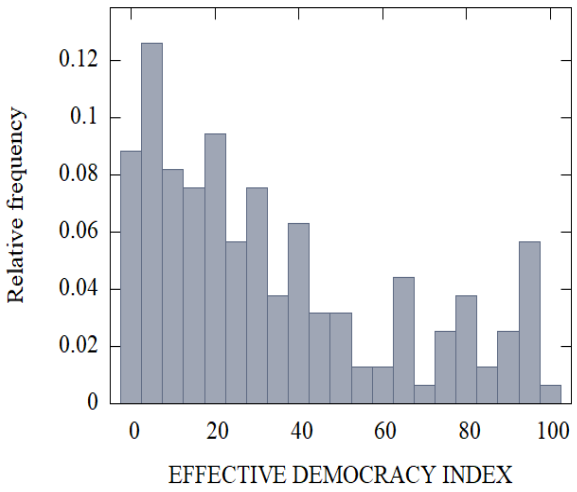
Summary statistics and Relative Frequency, using the observations 1 – 159 for the variable V-DEM'S POLYARCHY INDEX

Mean	0.54018
Median	0.557
Minimum	0.028
Maximum	0.913
Standard deviation	0.24496
C.V.	0.45348
Skewness	-0.1827
Ex. Kurtosis	-1.1697
5% percentile	0.125
95% percentile	0.875
Interquartile range	0.438
Missing obs.	0



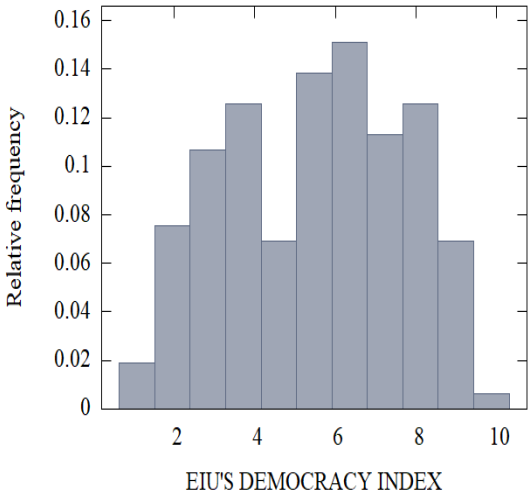
Summary statistics and Relative Frequency, using the observations 1 – 159 for the variable THE ECONOMIST INTELLIGENCE UNIT'S DEMOCRACY INDEX

Mean	5.4996
Median	5.7
Minimum	1.08
Maximum	9.87
Standard deviation	2.1751
C.V.	0.3955
Skewness	-0.1034
Ex. Kurtosis	-1.0147
5% percentile	1.93
95% percentile	9.09
Interquartile range	3.6
Missing obs.	0



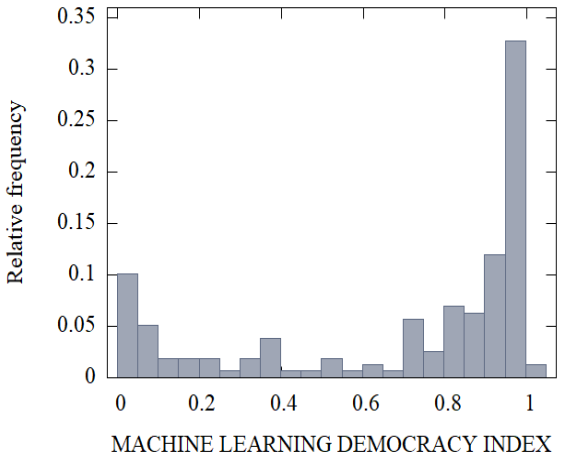
Summary statistics and Relative Frequency, using the observations 1 – 159 for the variable EFFECTIVE DEMOCRACY INDEX

Mean	**33.891**
Median	25.502
Minimum	0
Maximum	100
Standard deviation	29.286
C.V.	0.86414
Skewness	0.79703
Ex. Kurtosis	-0.5572
5% percentile	0
95% percentile	93.902
Interquartile range	40.652
Missing obs.	0



Summary statistics and Relative Frequency, using the observations 1 – 159 for the variable MACHINE LEARNING DEMOCRACY INDEX

Mean	**0.68209**
Median	0.86734
Minimum	0.00046
Maximum	0.99688
Standard deviation	0.3547
C.V.	0.52001
Skewness	-0.8851
Ex. Kurtosis	-0.9611
5% percentile	0.02141
95% percentile	0.98961
Interquartile range	0.60062
Missing obs.	0



APPENDIX B

In this appendix are reported the raw data and the method of construction used to compute the Effective democracy index (EDI). The theoretical approach is reported in the main body of this work in the paragraph "Effective Democracy Index".

The EDI is obtain multiplying the Democratic Rights Index and the Rule of Law index as shown in the formula below:

$$EDI = DRI * RLI$$

The DRI is obtained with data from the Freedom House index, converted into a 0 to 100 scale:

$$DRI = (14 – (PR + CL))/0.12$$

The RLI is obtained with data from the World Bank's Worldwide Governance Indicators (WGI) Rule of Law index, converted into a 0 to 1 scale:

$$RLI = (COS – LOS)/ (HOS – LOS)$$

To create the RLI the two values at the extreme of the WGI Rule of Law are taken as the highest observed score (HOS) and the lowest observed score (LOS) to

convert the index into a 0 to 1 scale[228]. In 2018 the HOS is Finland with a score of 2.08 while the LOS is Venezuela with a score of -2.32.

Having compute both the DRI and the RLI to obtain the EDI the two sub-indexes need to be multiplied between each other. All the data are reported in the table below.

COUNTRY	WGI RoL	FH	DRI	RLI	EDI
Afghanistan	-1,664	11	25,000	0,150	3,741
Albania	-0,403	6	66,667	0,436	29,067
Algeria	-0,741	11	25,000	0,359	8,983
Angola	-1,048	12	16,667	0,289	4,825
Argentina	-0,244	4	83,333	0,472	39,357
Armenia	-0,149	9	41,667	0,494	20,570
Australia	1,715	2	100,000	0,917	91,730
Austria	1,896	2	100,000	0,958	95,836
Azerbaijan	-0,588	13	8,333	0,394	3,285
Bahrain	0,413	13	8,333	0,621	5,178
Bangladesh	-0,641	8	50,000	0,382	19,102
Belarus	-0,830	12	16,667	0,339	5,650
Belgium	1,377	2	100,000	0,840	84,037
Benin	-0,673	4	83,333	0,375	31,223
Bhutan	0,549	7	58,333	0,652	38,058
Bolivia	-1,145	6	66,667	0,267	17,833
Botswana	0,465	5	75,000	0,633	47,500
Brazil	-0,252	4	83,333	0,470	39,190
Bulgaria	-0,070	4	83,333	0,512	42,648
Burkina Faso	-0,445	7	58,333	0,426	24,878
Burundi	-1,494	13	8,333	0,188	1,569
Cabo Verde	0,444	2	100,000	0,629	62,854

[228] For the theoretical foundation of this procedure see the relevant paragraph in the main body of this work.

COUNTRY	WGI RoL	FH	DRI	RLI	EDI
Cambodia	-1,112	11	25,000	0,275	6,876
Cameroon	-1,078	12	16,667	0,283	4,714
Canada	1,757	2	100,000	0,927	92,665
Central African Rep.	-1,683	14	0,000	0,145	0,000
Chad	-1,301	13	8,333	0,232	1,933
Chile	1,092	2	100,000	0,776	77,566
China	-0,203	13	8,333	0,482	4,013
Colombia	-0,406	6	66,667	0,435	29,024
Comoros	-1,072	7	58,333	0,284	16,579
Congo (Brazzaville)	-1,099	12	16,667	0,278	4,634
Congo (Kinshasa)	-1,779	13	8,333	0,123	1,029
Costa Rica	0,481	2	100,000	0,637	63,691
Cote d'Ivoire	-0,576	8	50,000	0,397	19,836
Croatia	0,353	3	91,667	0,608	55,711
Cuba	-0,444	13	8,333	0,427	3,556
Cyprus	0,754	2	100,000	0,699	69,881
Czech Republic	1,055	2	100,000	0,767	76,731
Denmark	1,815	2	100,000	0,940	94,003
Djibouti	-0,918	11	25,000	0,319	7,975
Dominican Republic	0,664	6	66,667	0,441	29,432
Ecuador	-0,639	6	66,667	0,383	25,502
Egypt	-0,414	12	16,667	0,434	7,225
El Salvador	-0,825	5	75,000	0,340	25,510
Equatorial Guinea	-1,516	14	0,000	0,183	0,000
Eritrea	-1,580	14	0,000	0,169	0,000
Estonia	1,241	2	100,000	0,809	80,948
Ethiopia	-0,428	13	8,333	0,430	3,587
Fiji	-0,136	6	66,667	0,497	33,111
Finland	2,079	2	100,000	1,000	100,000
France	1,434	3	91,667	0,853	78,236
Gabon	-0,704	12	16,667	0,368	6,128
Gambia	-0,431	9	41,667	0,430	17,909
Georgia	0,328	6	66,667	0,602	40,140
Germany	1,632	2	100,000	0,898	89,826
Ghana	0,073	3	91,667	0,544	49,889

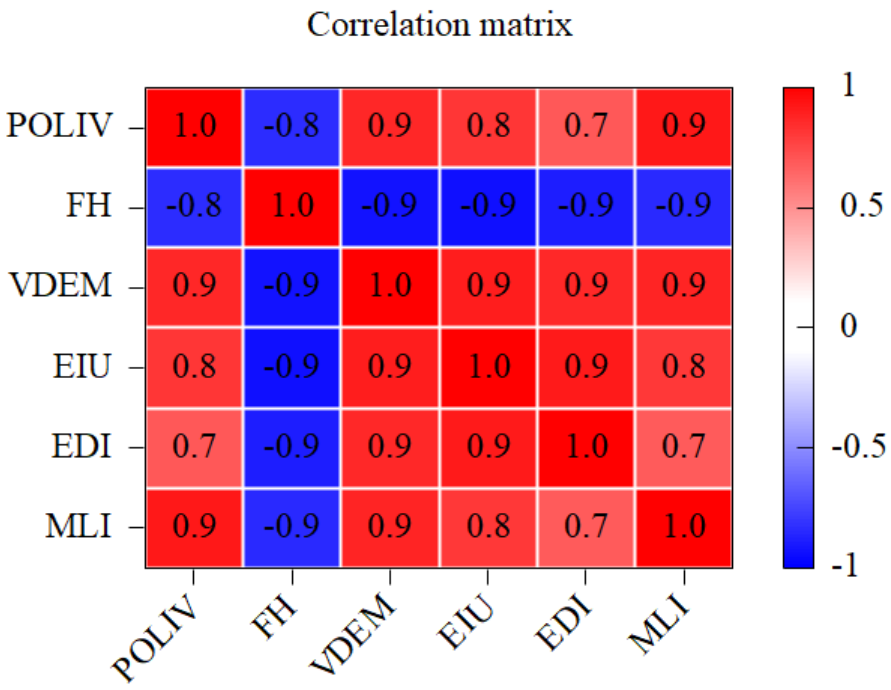
COUNTRY	WGI RoL	FH	DRI	RLI	EDI
Greece	0,139	4	83,333	0,559	46,606
Guatemala	-1,036	8	50,000	0,292	14,616
Guinea	-1,208	10	33,333	0,253	8,437
Guinea-Bissau	-1,232	10	33,333	0,248	8,258
Guyana	-0,373	5	75,000	0,443	33,225
Haiti	-1,052	10	33,333	0,289	9,619
Honduras	-1,029	8	50,000	0,294	14,695
Hungary	0,585	5	75,000	0,660	49,533
India	0,026	5	75,000	0,533	40,010
Indonesia	-0,315	6	66,667	0,456	30,398
Iran	-0,694	12	16,667	0,370	6,168
Iraq	-1,754	11	25,000	0,129	3,232
Ireland	1,450	2	100,000	0,857	85,712
Israel	0,994	4	83,333	0,753	62,786
Italy	0,269	2	100,000	0,589	58,870
Jamaica	-0,232	5	75,000	0,475	35,625
Japan	1,534	2	100,000	0,876	87,615
Jordan	0,232	10	33,333	0,580	19,344
Kazakhstan	-0,430	12	16,667	0,430	7,168
Kenya	-0,411	8	50,000	0,434	21,714
Kuwait	0,211	10	33,333	0,576	19,184
Kyrgyzstan	-0,904	10	33,333	0,322	10,739
Laos	-0,839	13	8,333	0,337	2,809
Latvia	0,957	4	83,333	0,745	62,087
Lebanon	-0,798	10	33,333	0,346	11,549
Lesotho	-0,335	6	66,667	0,452	30,108
Liberia	-0,990	6	66,667	0,303	20,188
Lithuania	0,957	2	100,000	0,745	74,513
Luxembourg	1,811	2	100,000	0,939	93,902
Madagascar	-0,814	7	58,333	0,343	19,999
Malawi	-0,378	6	66,667	0,442	29,447
Malaysia	0,623	8	50,000	0,669	33,462
Mali	-0,797	9	41,667	0,346	14,437
Mauritania	-0,684	11	25,000	0,372	9,306
Mauritius	0,779	3	91,667	0,705	64,580

COUNTRY	WGI RoL	FH	DRI	RLI	EDI
Mexico	-0,637	6	66,667	0,383	25,537
Moldova	-0,412	6	66,667	0,434	28,944
Mongolia	-0,267	3	91,667	0,467	42,799
Montenegro	0,100	6	66,667	0,550	36,691
Morocco	-0,138	10	33,333	0,496	16,543
Mozambique	-1,042	8	50,000	0,291	14,550
Myanmar	-1,033	10	33,333	0,293	9,766
Namibia	0,284	4	83,333	0,592	49,338
Nepal	-0,478	7	58,333	0,419	24,451
Netherlands	1,787	2	100,000	0,934	93,353
New Zealand	1,876	2	100,000	0,954	95,388
Nicaragua	-1,058	9	41,667	0,287	11,976
Niger	-0,579	8	50,000	0,396	19,806
Nigeria	-0,880	8	50,000	0,328	16,385
North Korea	-1,634	14	0,000	0,156	0,000
North Macedonia	-0,246	7	58,333	0,472	27,524
Norway	1,966	2	100,000	0,974	97,417
Oman	0,465	11	25,000	0,633	15,831
Pakistan	-0,674	9	41,667	0,375	15,610
Panama	-0,092	4	83,333	0,507	42,228
Papua New Guinea	-0,769	6	66,667	0,353	23,531
Paraguay	-0,524	6	66,667	0,409	27,248
Peru	-0,529	5	75,000	0,407	30,559
Philippines	-0,475	6	66,667	0,420	27,983
Poland	0,420	3	91,667	0,623	57,123
Portugal	1,143	2	100,000	0,787	78,724
Qatar	0,735	11	25,000	0,695	17,364
Romania	0,360	4	83,333	0,609	50,780
Russia	-0,782	13	8,333	0,350	2,916
Rwanda	0,117	12	16,667	0,554	9,236
Saudi Arabia	0,142	14	0,000	0,560	0,000
Senegal	-0,207	4	83,333	0,481	40,047
Serbia	-0,184	5	75,000	0,486	36,432
Sierra Leone	-0,767	6	66,667	0,353	23,557
Singapore	1,845	8	50,000	0,947	47,337

COUNTRY	WGI RoL	FH	DRI	RLI	EDI
Slovakia	0,502	2	100,000	0,642	64,170
Slovenia	1,059	2	100,000	0,768	76,811
South Africa	-0,102	4	83,333	0,504	42,034
South Korea	1,237	4	83,333	0,809	67,379
Spain	1,013	2	100,000	0,758	75,776
Sri Lanka	0,026	7	58,333	0,533	31,119
Sudan	-1,120	14	0,000	0,273	0,000
Suriname	-0,064	4	83,333	0,513	42,761
Sweden	1,826	2	100,000	0,942	94,247
Switzerland	1,931	2	100,000	0,966	96,635
Syria	-2,048	14	0,000	0,062	0,000
Taiwan	1,112	2	100,000	0,780	78,032
Tajikistan	-1,279	13	8,333	0,237	1,976
Tanzania	-0,554	8	50,000	0,402	20,088
Thailand	0,023	11	25,000	0,533	13,320
Timor-Leste	-1,128	5	75,000	0,271	20,362
Togo	-0,590	8	50,000	0,394	19,686
Trinidad and Tobago	-0,120	4	83,333	0,500	41,697
Tunisia	0,039	5	75,000	0,536	40,234
Turkey	-0,318	11	25,000	0,456	11,388
Turkmenistan	-1,465	14	0,000	0,195	0,000
Uganda	-0,293	10	33,333	0,461	15,367
Ukraine	-0,716	6	66,667	0,365	24,332
United Arab Emirates	0,807	13	8,333	0,711	5,924
United Kingdom	1,642	2	100,000	0,901	90,072
USA	1,515	3	91,667	0,872	79,903
Uruguay	0,593	2	100,000	0,662	66,235
Uzbekistan	-1,069	14	0,000	0,285	0,000
Venezuela	-2,323	11	25,000	0,000	0,000
Vietnam	-0,004	12	16,667	0,527	8,780
Zambia	-0,345	8	50,000	0,449	22,460
Zimbabwe	-1,273	11	25,000	0,239	5,964

APPENDIX C

In this appendix are reported additional graphic material linked to the correlation analysis conducted on the quantitative results of the selected indexes, explained in the final part of the first chapter of this work. Below is reported the graphic representation of the correlation matrix used in the paragraph I.4.3 Comparative score correlation analysis[229].

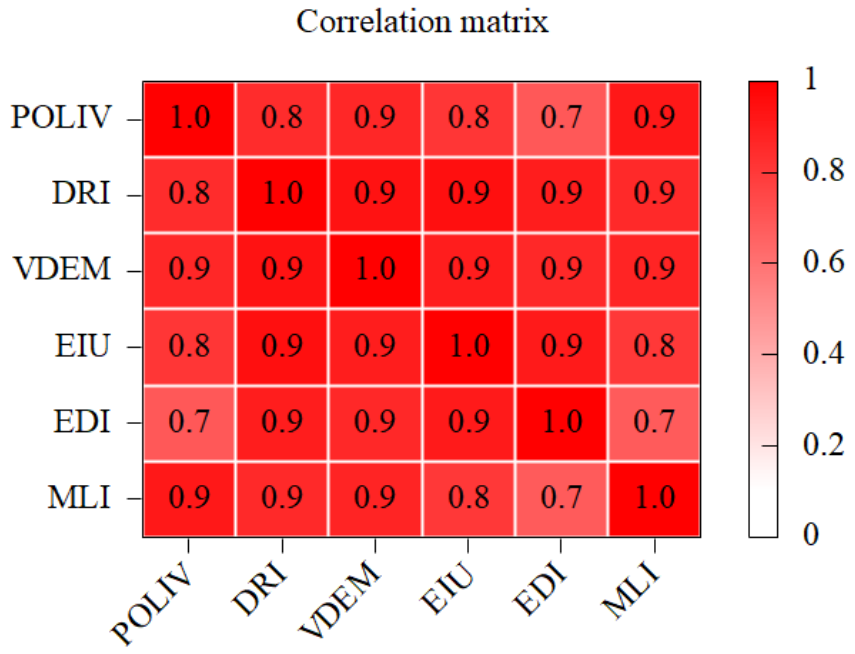


Here is inserted the complete correlation matrix where the Freedom House index is been replaced by the Democratic rights index (DRI) and its graphical

[229] Figure obtained with the econometric software "Gretl".

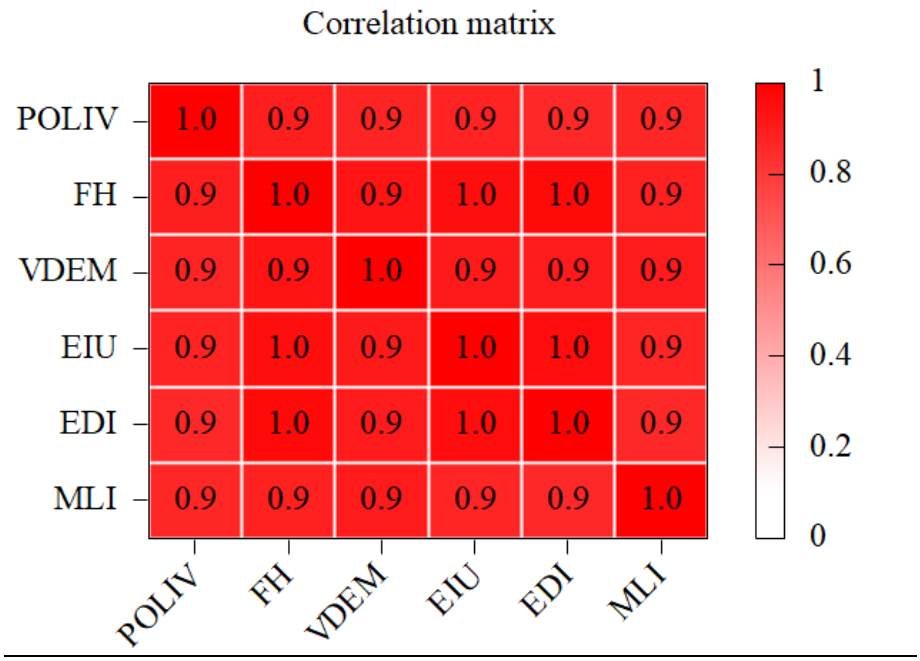
representation[230]. As expected, the correlation indexes for DRI in absolute value equal to the correlation indexes computed for the Freedom House index.

POL IV	DRI	V-DEM	EIU	EDI	MLI	
1	0.8453	0.8613	0.8084	0.6885	0.9167	**POL IV**
	1	0.9354	0.947	0.8991	0.8566	**DRI**
		1	0.8994	0.8575	0.8733	**V-DEM**
			1	0.9099	0.8038	**EIU**
				1	0.6788	**EDI**
					1	**MLI**



Below is reported the graphical representation of the rank correlation matrix[231] proposed in the paragraph I.4.4 Comparative rank correlation analysis

[230] Both table and figure are obtained with the econometric software "Gretl".
[231] Figure obtained with the econometric software "Gretl".



The interested reader will find below the comprehensive data with all the rankings computed for all democracy indexes for each country.

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Afghanistan	117	117	115	137	139	104
Albania	33	63	86	73	72	53
Algeria	115	117	123	121	121	115
Angola	120	129	114	118	135	120
Argentina	33	38	31	45	56	26
Armenia	69	102	93	99	88	88
Australia	1	1	15	8	11	32
Austria	1	1	37	15	4	8
Azerbaijan	143	139	143	143	142	138
Bahrain	156	139	152	142	134	146
Bangladesh	140	89	119	85	98	129
Belarus	143	129	130	132	133	124
Belgium	52	1	14	29	16	51

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Benin	69	38	59	78	65	43
Bhutan	69	82	68	91	58	73
Bolivia	69	63	63	80	100	94
Botswana	52	53	52	26	43	63
Brazil	52	38	45	48	57	25
Bulgaria	33	38	73	44	48	21
Burkina Faso	86	82	46	100	81	92
Burundi	117	139	147	147	148	140
Cabo Verde	1	1	41	24	33	74
Cambodia	132	117	135	120	128	132
Cameroon	132	129	120	127	136	135
Canada	1	1	19	5	10	2
Central Afr. Rep.	86	151	103	156	150	105
Chad	120	139	126	155	147	128
Chile	1	1	18	21	22	33
China	143	139	157	125	138	151
Colombia	69	63	58	49	73	75
Comoros	125	82	92	116	102	84
Congo (Brazzaville)	132	129	130	126	137	136
Congo (Kinshasa)	125	139	124	157	149	107
Costa Rica	1	1	4	18	32	14
Cote d'Ivoire	105	89	60	108	93	116
Croatia	33	31	53	58	38	60
Cuba	139	139	145	136	141	158
Cyprus	1	1	21	33	27	24
Czech Republic	33	1	30	32	24	19
Denmark	1	1	5	4	7	27
Djibouti	112	117	133	140	125	127
Dominican Rep.	69	63	69	59	71	34
Ecuador	98	63	56	66	80	58
Egypt	132	129	140	122	126	141
El Salvador	52	53	57	74	79	67
Equatorial Guinea	140	151	145	153	150	155
Eritrea	143	151	158	145	150	150
Estonia	33	1	3	21	17	9

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Ethiopia	116	139	127	123	140	130
Fiji	105	63	88	76	64	61
Finland	1	1	17	7	1	3
France	33	31	19	27	20	5
Gabon	112	129	105	119	130	103
Gambia	105	102	79	106	99	96
Georgia	69	63	55	86	53	28
Germany	1	1	24	12	13	15
Ghana	52	31	61	55	40	41
Greece	1	38	26	37	45	7
Guatemala	52	89	83	84	109	70
Guinea	105	107	106	131	123	110
Guinea-Bissau	86	107	91	150	124	87
Guyana	69	53	70	52	63	47
Haiti	98	107	101	98	118	117
Honduras	69	89	111	82	108	77
Hungary	1	53	84	55	41	91
India	33	53	80	39	55	80
Indonesia	33	63	70	63	68	18
Iran	143	129	141	144	129	114
Iraq	86	117	102	109	143	106
Ireland	1	1	21	5	15	11
Israel	86	38	51	28	34	55
Italy	1	1	11	31	36	4
Jamaica	33	53	34	45	61	56
Japan	1	1	33	20	14	72
Jordan	125	107	132	110	96	133
Kazakhstan	140	129	137	138	127	134
Kenya	33	89	98	95	87	81
Kuwait	143	107	122	111	97	142
Kyrgyzstan	52	107	88	95	116	83
Laos	143	139	153	145	145	153
Latvia	52	38	21	36	35	36
Lebanon	86	107	95	102	114	101
Lesotho	52	63	78	54	69	76
Liberia	69	63	72	90	90	57
Lithuania	1	1	35	34	26	69
Luxembourg	1	1	9	11	8	50

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Madagascar	86	82	94	92	92	95
Malawi	86	63	82	87	70	64
Malaysia	69	89	113	50	62	78
Mali	98	102	87	88	111	112
Mauritania	120	117	108	114	119	118
Mauritius	1	31	27	16	30	52
Mexico	52	63	48	69	78	46
Moldova	33	63	77	76	74	29
Mongolia	1	31	65	60	46	22
Montenegro	33	63	97	78	59	65
Morocco	132	107	125	97	103	111
Mozambique	98	89	96	111	110	108
Myanmar	52	107	116	113	117	102
Namibia	86	38	54	67	42	109
Nepal	69	82	67	94	82	71
Netherlands	1	1	16	10	9	49
New Zealand	1	1	11	3	5	6
Nicaragua	86	102	138	117	113	131
Niger	98	89	75	115	94	97
Nigeria	69	89	76	104	104	100
North Korea	156	151	156	159	150	147
North Macedonia	33	82	80	75	76	59
Norway	1	1	1	1	2	20
Oman	151	117	144	135	105	157
Pakistan	69	102	104	107	106	98
Panama	33	38	38	43	49	31
Papua New Guinea	98	63	99	72	85	79
Paraguay	33	63	66	68	77	54
Peru	33	53	43	57	67	42
Philippines	52	63	85	51	75	89
Poland	1	31	50	52	37	62
Portugal	1	1	9	25	19	16
Qatar	156	117	155	128	101	156
Romania	33	38	64	64	39	48
Russia	105	139	128	138	144	121
Rwanda	125	129	134	123	120	137
Saudi Arabia	156	151	159	151	150	152

COUNTRY	POL IV	FH	V-DEM	EIU	EDI	MLI
Senegal	69	38	47	71	54	93
Serbia	52	53	110	61	60	86
Sierra Leone	69	63	74	101	84	66
Singapore	120	89	109	64	44	123
Slovakia	1	1	28	42	31	44
Slovenia	1	1	28	34	23	38
South Africa	33	38	49	38	50	82
South Korea	52	38	13	19	28	12
Spain	1	1	31	17	25	17
Sri Lanka	86	82	62	69	66	40
Sudan	132	151	129	148	150	149
Suriname	98	38	40	47	47	1
Sweden	1	1	2	2	6	39
Switzerland	1	1	7	9	3	45
Syria	154	151	151	158	150	154
Taiwan	1	1	36	30	21	13
Tajikistan	125	139	148	151	146	139
Tanzania	112	89	90	88	91	99
Thailand	125	117	149	102	112	144
Timor-Leste	52	53	42	40	89	37
Togo	120	89	100	133	95	119
Trinidad and Tobago	1	38	39	41	51	30
Tunisia	69	53	44	61	52	68
Turkey	132	117	117	105	115	125
Turkmenistan	151	151	149	154	150	143
Uganda	117	107	112	93	107	122
Ukraine	105	63	107	81	83	85
United Arab Emirates	151	139	154	141	132	159
United Kingdom	52	1	8	13	12	10
USA	52	31	25	23	18	35
Uruguay	1	1	6	14	29	23
Uzbekistan	154	151	142	149	150	148
Venezuela	125	117	136	129	150	126
Vietnam	143	129	139	134	122	145
Zambia	86	89	118	83	86	90
Zimbabwe	105	117	121	129	131	113

APPENDIX D

In this appendix will be reported additional information relative to the topics analysed in chapter II.

Below are reported the estimates related to different regions of the world for the period 1950-2009, taken from COLAGROSSI M., ROSSIGNOLI D., MAGGIONI M. A., *Does democracy cause growth? A meta-analysis (of 2000 regressions)*, European Journal of Political Economy, 61, 2020.

	All regions	Africa	East Asia	East Europe	Latin America	Middle East	South Asia	High-income
All periods	0.1212*	0.2039***	−0.0007	0.0430	0.0162	0.0592	−0.0835	0.0523
	(0.0558)	(0.0582)	(0.0719)	(0.0626)	(0.0607)	(0.0606)	(0.0721)	(0.0583)
1950–2009	0.0660	0.1487***	−0.0559	−0.0122	−0.0390	0.0040	−0.1387*	−0.0029
	(0.0403)	(0.0440)	(0.0591)	(0.0492)	(0.0470)	(0.0478)	(0.0629)	(0.0439)
1960–2009	0.0710	0.1537***	−0.0509	−0.0072	−0.0340	0.0090	−0.1337*	0.0021
	(0.0367)	(0.0407)	(0.0577)	(0.0466)	(0.0440)	(0.0449)	(0.0599)	(0.0409)
1970–2009	0.1315***	0.2143***	0.0096	0.0533	0.0265	0.0695	−0.0732	0.0626
	(0.0377)	(0.0415)	(-0.0583)	(0.0474)	(0.0448)	(0.0457)	(0.0605)	(0.0417)
1980–2009	0.1739***	0.2566***	0.0520	0.0957	0.0689	0.1119*	−0.0308	0.1050
	0.0354	0.0394	(0.0567)	(0.0454)	(0.0428)	(0.0436)	(0.0590)	(0.0395)

Below are reported the models taken from NARAYAN P. K., NARAYAN S., SMYTH R., *Does democracy facilitate economic growth or does economic growth facilitate democracy? An empirical study of Sub-Saharan Africa*, Economic Modelling, 28, 2011, 900-910. In those models are analysed the possibility of Granger causality and reciprocity of the democracy-economy nexus for each African state.

Country	F-Test		Granger causality			Long-run elasticities		
	$F_Y(Y\|D)$	$F_D(D\|Y)$	ECT_{t-1} (t-statistics)	$Y \nRightarrow D$ [prob.]	$D \nRightarrow Y$ [prob.]	Dynamic OLS (t-statistics)	Phillip–Hansen (t-statistics)	Engle–Granger (t-statistics)
Benin	1.3131	1.2785	–	0.3234 [0.7278]	0.3270 [0.7253]	–	–	–
Botswana	1.0682	4.2544	−0.0332[a] (−2.7958)	0.9568 [0.4028]	2.5554 [0.1055]	−0.0011 (−0.0005)	5.9959[a] (2.7954)	5.8934[a] (3.9174)
Burkina Faso	1.3491	0.7948	–	1.8722 [0.1841]	0.0705 [0.932]	–	–	–
Burundi	0.8575	1.8044	–	0.5773 [0.5715]	0.7914 [0.4684]	–	–	–
Cameroon	0.4292	3.9331	−0.1845[a] (−3.7194)	0.6306 [0.5443]	1.5816 [0.2345]	0.1259 (0.5510)	0.2434 (0.9663)	0.2401 (1.2920)
Central Africa	1.1285	0.9931	–	1.1378 [0.3425]	3.0810[c] [0.0707]	–	–	–
Chad	0.5927	1.4260	–	1.1565 [0.3369]	0.7380 [0.4920]	–	–	–
Congo-K	9.608	–	−0.8305 (−1.5637)	–	–	0.0507 (0.6421)	–	–
Cote d'Ivoire	0.2626	4.1068	−0.2076[c] (−1.9242)	0.1015 [0.9040]	0.2580 [0.7754]	0.4004[a] (4.1622)	0.4782[a] (4.3397)	0.4447[a] (4.6897)
Gabon	0.3744	5.1528	−0.7026[a] (−5.1687)	1.0103 [0.3839]	0.3458 [0.7123]	0.4509[a] (7.7238)	0.3987[a] (4.9738)	0.3630[a] (5.4238)
Gambia	0.6092	1.8224	–	–	–	–	–	–
Ghana	1.3968	1.7417	–	0.4713 [0.6317]	0.7299 [0.4957]	–	–	–
Kenya	1.4204	0.9121	–	0.2985 [0.7455]	0.8674 [0.4369]	–	–	–
Lesotho	0.5742	1.9386	–	0.0518 [0.9496]	0.0668 [0.9356]	–	–	–
Madagascar[1]	3.7759	–	−0.2605[a] (−2.5141)	2.1584 [0.1445]	–	0.1535[b] (2.3575)	0.0911[b] (2.3670)	0.0802[a] (3.2807)
Madagascar[2]	–	13.2605	−0.0142 (−0.1169)	–	0.9826 [0.3936]	2.1857[b] (2.3573)	3.3437[b] (2.3137)	3.8612[a] (3.2807)
Malawi	0.7253	1.4447	–	1.4541 [0.2598]	0.1202 [0.8875]	–	–	–
Mali	1.1146	3.0889	–	–	–	–	–	–
Mauritius	4.1186	1.6787	−1.0000 (none)	–	–	0.0092 (0.9822)	–	–
Niger	0.0364	6.9659	−0.4173[a] (−2.9376)	0.0882 [0.9163]	0.3325 [0.7215]	0.0808[a] (4.9412)	0.0966[a] (4.2369)	0.0937[a] (4.6199)
Nigeria[1]	4.7320	–	2.6316 (−0.5502)	4.1538[b] [0.0340]	–	−0.3664[a] (−3.4298)	−0.1132 (−1.5617)	−0.0520 (−1.0985)
Nigeria[2]	–	3.8280	−0.0477[a] (−2.9376)	–	1.0498 [0.3716]	−1.4752[a] (−3.4291)	−0.8601 (−1.1169)	−0.9587 (−1.0985)
Rwanda	3.8760	0.3682	−0.7286[a] (−3.9269)	0.2896 [0.6789]	0.4598 [0.8765]	0.6238[a] (5.2313)	0.9311[a] (4.7866)	0.8974[a] (4.1222)
Senegal	2.2171	1.6101	–	–	–	–	–	–
Sierra Leone	5.1293	2.6787	−0.4003[a] (−2.4477)	1.0737 [0.3627]	0.4565 [0.6406]	−2.6548[a] (−2.6166)	−0.5167[a] (3.5906)	−1.8911[b] (−1.9790)
South Africa	5.708	0.3973	−0.2962[a] (−2.5156)	1.8540 [0.1853]	0.5799 [0.5701]	0.6770[a] (5.4132)	0.3430[b] (2.0972)	0.2494[b] (2.1539)
Sudan	0.1735	5.3618	0.0910[c] (1.9156)	0.0690 [0.9336]	1.2214 [0.3181]	0.0552 (0.4934)	−0.1154 (−1.0303)	–
Swaziland	5.3618	0.1735	−0.2435[c] (−1.8747)	0.0265 [0.9739]	0.2055 [0.8192]	1.6470[a] (8.6098)	0.4951[a] (4.3742)	1.2972[a] (6.1135)
Togo	2.7600	1.6228	–	0.0605 [0.9414]	0.2917 [0.7505]	–	–	–
Zambia	0.7849	2.5205	–	8.9101[a] [0.0020]	0.0461 [0.9550]	–	–	–
Zimbabwe	0.86752	2.0930	–	0.4306 [0.6563]	0.8370 [0.4484]	–	–	–

Notes: The t-statistics for the long-run Granger causality results and for the long-run elasticities are in parenthesis while the probability values for the short-run Granger causality results are in square brackets. [1]Denotes model where GDP is the dependent variable. [2]Denotes model where democracy is the dependent variable.

[a] Denotes statistical significance at the 1%, level.

[c] Denotes statistical significance at the 10% level.

[b] Denotes statistical significance at the 5% level.

Country	Granger causality				Long-run elasticities	
	Long-run		Short-run		Freedom House[c]	LIEC[d]
	Freedom House	LIEC	Freedom House	LIEC		
Benin						
Botswana	$Y \Rightarrow D$[a]) $D \Rightarrow Y$[b]	$Y \Rightarrow D$	$D \Rightarrow Y$		D→Y[e] 0.60 to 1.02 Y→D[f] 0.12 to 0.27	Y→D 5.9 to 6.00
Burkina Faso						
Burundi			$D \Rightarrow Y$			
Cameroon		$Y \Rightarrow D$				
Chad	$Y \Rightarrow D$				Y→D 0.22	
Central Africa				$D \Rightarrow Y$		
Congo – B	$Y \Rightarrow D$				Y→D −0.81	
Congo – K			$D \Rightarrow Y$			
Cote d'Ivoire	$Y \Rightarrow D$	$Y \Rightarrow D$				Y→D 0.40 to 0.48
Gabon	$D \Rightarrow Y$	$Y \Rightarrow D$			D→Y −0.41	Y→D 0.36 to 0.40
Gambia						
Ghana			$D \Rightarrow Y$			
Kenya	$Y \Rightarrow D$				Y→D −0.23 to −0.41	
Lesotho						
Madagascar		$D \Rightarrow Y$				D→Y 0.08 to 0.15 Y→D 2.18 to 3.86
Malawi						
Mali						
Mauritius		$D \Rightarrow Y$				
Niger	$Y \Rightarrow D$	$Y \Rightarrow D$			Y→D 0.68 to 1.57	Y→D 0.08 to 0.10
Nigeria		$Y \Rightarrow D$		$Y \Rightarrow D$	D→Y −0.35	D→Y −0.37 Y→D −1.48
Rwanda		$D \Rightarrow Y$			D→Y 1.73 to 1.95	D→Y 0.6 to 0.9
Senegal			$Y \Rightarrow D$			
Sierra Leone		$D \Rightarrow Y$				D→Y −0.52 to −2.66
South Africa		$D \Rightarrow Y$				D→Y 0.25 to 0.68
Sudan						
Swaziland		$D \Rightarrow Y$				D→Y 0.50 to 1.65
Togo						
Zambia				$Y \Rightarrow D$		
Zimbabwe			$Y \Rightarrow D$			

Notes:

(a) $Y \Rightarrow D$ means Granger causality runs from GDP to democracy.

(b) $D \Rightarrow Y$ means Granger causality runs from democracy to GDP.

To make the results easier to read and to be consistent with the Beck et al. (2001) results in Table 4, D – indicates the sign has been changed.

(c) the sign on the long run estimators with the Freedom House data have been changed to make the results correspond to those with the LIEC database. Thus, in the reported results, a positive coefficient means that there is a positive relationship between democracy and economic growth.

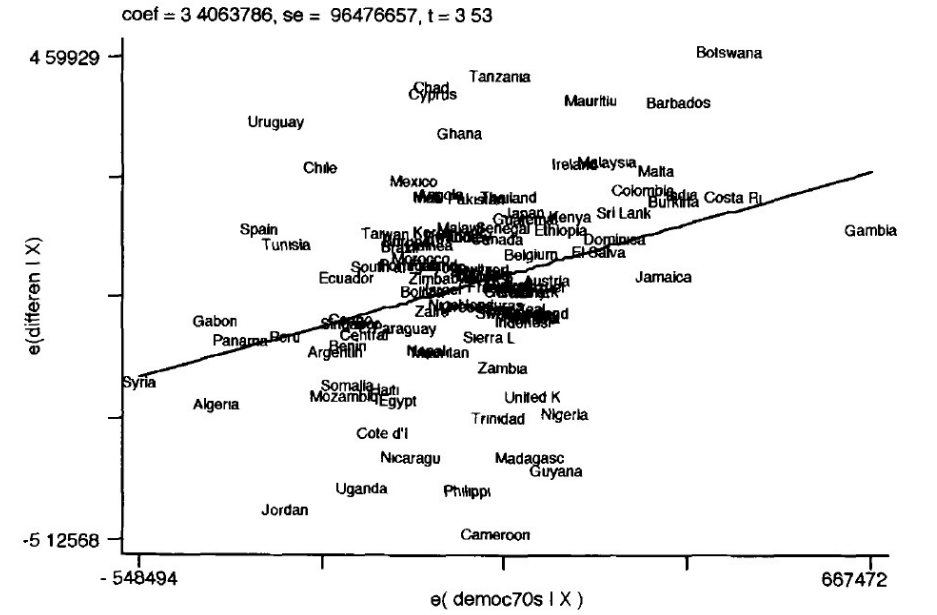
(d) The LIEC database is scaled 1 = least democratic to 7 = most democratic so a positive coefficient means that there is a positive relationship between democracy and economic growth.

(e) D→Y refers to long-run elasticities when GDP is the dependent variable.

(f) Y→D refers to long-run elasticities means democracy is the dependent variable.

Here are reported the results from the Rodrik[232] model for estimating the effect of democracy on short-term economic performance.

Democracy and growth differentials (pre- and post- break year in trend growth)



[232] RODRIK D., *Institutions for High-Quality Growth: What they are and how to acquire them*, Studies in Comparative International Development, 35, 2000, 3-31.

Below is inserted the table with the results of the *Probability of Growth reversals* developed by CUBERES AND JERZMANOWSKY in *Democracy, Diversification and Growth Reversals*.

Probability of Growth Reversals

	Pooled	RE	Pooled	RE
(*a*) *Cycles +/−*				
Democracy	−0.232**	−0.241*	−0.196**	−0.209**
	(0.114)	(0.124)	(0.097)	(0.106)
Income	0.038	0.034	0.041	0.041
	(0.090)	(0.103)	(0.082)	(0.092)
N	367	367	625	625
(*b*) *Cycles above/below*				
Democracy	−0.172	−0.172*†	−0.166*	−0.166*
	(0.111)	(0.106)	(0.093)	(0.089)
Income	0.057	0.057	0.043	0.043
	(0.085)	(0.090)	(0.078)	(0.078)
N	364	364	625	625
Time Effects	YES	YES	NO	NO
Trend	NO	NO	YES	YES

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