Unraveling the Digital Governance Systems Divide

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Abstract

Digital governance and related systems are becoming a vital complement to traditional forms of political participation, a trend that will accelerate as younger generations embrace digital lifestyles. In a world where technology and democracy are increasingly intertwined, understanding the driving forces of digital governance is of paramount importance. This research provides valuable information on the global state of digital democracy and the forces behind the digital divide. We are using the DigiPartIndex, a robust index to measure the availability of digital governance systems and conduct a comparative analysis for a representative sample of 36 countries. In this macro-level quantitative study, we are using regression analysis to examine the factors behind the varying availability of digital governance systems. Our research highlights that economic development, especially higher GDP per capita, is still the key factor determining a country's digital governance system infrastructure.

Keywords

Digital governance, e-participation, digital divide, cross-sectional study, country comparison, index building

1. Introduction

Resonating with the contemporary lifestyles of ever broader segments of the world's population, digital political participation is likely to gain further momentum in the future. However, as we navigate the intersection of technological innovations and civic participation, a striking disparity emerges: the uneven availability of digital governance tools between countries. Why do some nations flourish as pioneers of online political engagement, while others lag behind in harnessing the full potential of digital tools for civic expression? Starting out from this question, the present paper delves into this particular "digital divide", with the aim to find some of the most pertinent explanations across countries on a macro-scale when it comes to the advancement of digital governance systems. Whereas most

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existing research on the digital divide concentrates on the individual as the unit of analysis[1], we focus on factors shaping the availability of digital governance systems on a national scale.

Digital political participation, often referred to as e-participation, is defined as the active involvement of citizens in policy design, decision-making, and implementation through modern information and communication technology (ICT) [2]. The use of ICT for this specific purpose can also be referred to as civic tech tools or digital governance systems. The terms can be used interchangeably. However, we prefer the latter. Assessing and comparing such systems across nations requires reliable metrics, which are currently often lacking or do not satisfy the requirement of measurement validity. Some metrics primarily emphasize e-government aspects, while others overemphasize informational components, neglecting the core participatory elements of the governance aspect. Consequently, indices such as the UN e-participation index [3], as well as the B-EPI [4] tend to inflate the scores for some countries. In addition, the applied methodology using rankings, strictly speaking, does not allow to calculate averages, variances, or to do linear regression analysis. To address such limitations, a new index, the DigiPartIndex[5], specifically designed to capture the spectrum of digital political participation encompassing the three spheres of opinion formation, co-creation and decision-making is used[6].

To capture the opinion-formation phase of political decision-making, we focus on digital governance systems allowing for e-deliberation, digital civic education and e-transparency. With regard to e-deliberation, we ask where and how a political discussion about voting issues, elections, political measures and politics in general can be conducted on the Internet. It is fundamental for opinion-forming that a discursive exchange is possible. The more structured, targeted and smart the applications that can be used for this purpose, the higher the score of an index should be. Another important aspect of opinion-forming concerns political education in the digital space. It should be possible to learn about politics with the help of the internet and online applications. In the digital sphere, as in political education in general, it is not just about knowledge, but also about acquiring the relevant skills. We ask ourselves where and how political education is offered and can take place on the internet. The more interactive, smart and skills-oriented the offerings, the more points the index should receive. For the opinion-forming dimension, we use an e-transparency indicator to assess how easily and how well a country offers information related to the political process and makes it available on the internet. The question here is what information can be accessed digitally and where, in order to be able to follow the political process as widely as possible. The data provided should not only make it possible to obtain information, but also to carry out smart monitoring of government activities. Efforts in this direction are commonly referred to as “open government” or “open data” platforms.

The second dimension of the index should map institutionalized exchanges between government agencies and civil society, we summarize as co-creation. The two components e-consultation and e-demands are recorded for this purpose. The emphasis is on the joint effort to collect the collective wisdom of the population through exchange, collecting opinions and depositing concerns. In the English-language literature, the terms ”crowd-sourcing” or ”wisdom of the crowd” have been coined for this purpose. The two instruments differ in terms of where the initiative for the exchange between the state and society originates from. In an e-consultation, the starting point is a government agency. In the case of an e-request, the trigger for the exchange process comes from society. For e-consultation, we therefore ask how the authorities, i.e. mainly parliaments and governments, seek online input from society. Then it also depends on how far-reaching and politically binding the consequences of such a consultation are for the political decision-making process. In the case of e-demands such as online petitions, the participation dimension is about what infrastructure is available to enable initiatives from society to politicians or the authorities. We also ask ourselves where and how parliaments or governments allow input for political concerns or measures on the Internet and how far-reaching the consequences of these tools are.

The third dimension of the index involves mapping elements of political decision-making, provided they can be used digitally. In addition to public debate and an exchange between the state and society, digital tools can be used to support the act of voting and electing. To this end, the foundations must first be laid in the form of electronic identification, i.e. an e-ID, so that it can then be used for e-voting, digital voting and elections, among other things. For the electronic identification indicator, we determine

how and for which public services an online identity can be used. Higher values are achieved by e-ID solutions when they are used directly and repeatedly for a government service, especially in the area of digital participation. For the last indicator measured, e-voting, we ask whether and what efforts have been made to use digital voting channels.

After this brief introduction to core concepts covered in the DigiPartIndex, we begin with a review of some relevant e-participation literature, followed by a presentation of the analytical framework with three main hypotheses to be tested. The methodological section explains in more detail how the variables were operationalized, how the data was collected and how it was analyzed. The focus of this article consists of a comparative analysis of the availability of digital governance systems in a globally representative sample of countries. Through this macro-level quantitative empirical study, conclusions are drawn to discern the key factors driving the availability of digital political participation at the national scale.

2. Related Work

While nearly all countries have embarked on the e-government journey, disparities in development levels persist, becoming all the more evident when it comes to the specific realm of e-participation [3]. This e-participation divide between countries has been widely argued to be of significant importance for democracies for the responsiveness, acceptance and legitimacy of political processes [7, 8, 9, 10]. The normative association between democracy and e-participation has given rise to a growing body of research addressing drivers and barriers to digital political participation developments. It can be classified into two streams: studies that focus on the demand-side, addressing factors facilitating citizens' digital engagement [11, 12, 13, 14], and studies that take a look at the supply-side of such processes [15, 16]. The present paper entrenches itself within the latter with an emphasis on "intentional activities of governments to support the participation of their citizens by digital technologies"[17, 2].

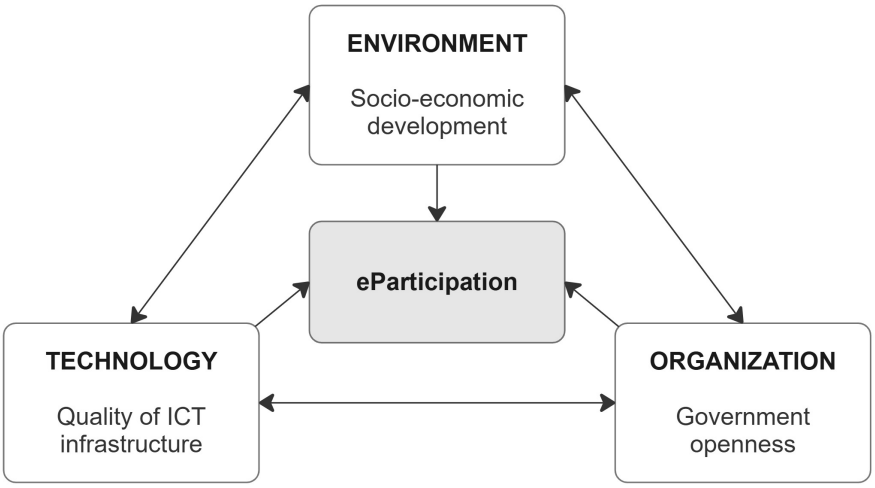
The existing literature on this subject has primarily emphasized e-government initiatives in a broad sense, with limited specific attention to digital political participation [18, 19, 20, 21]. Furthermore, the few studies on the supply-side of digitally-enhanced citizen engagement in political processes tend to be predominantly qualitative [22, 11, 23]. While these studies offer valuable insights into the meso and micro-level factors that influence governments' readiness to implement digital governance systems, they do not provide an analysis of global digital participation developments. Motivated by the will to uncover macro-level influences on the supply-side of e-participation tools across countries, the present research employs a quantitative empirical methodology.

Within the realm of the e-democracy literature, large-scale analyses aimed at quantifying and comparing cross-country digital political participation efforts already exist [16]. However, our contention is that the latter tend to rely on metrics exhibiting both theoretical and empirical limitations. For instance, the United Nations has developped a measurement for e-government, with one critical element in this context, being the e-Participation Index (EPI) [2]. Several adapted versions of the EPI have also emerged [4]. However, these indices tend to disproportionately emphasize e-government tools and their informational aspects, consequently overlooking or marginalizing the vital dimension of active civic engagement, which is crucial for a comprehensive and precise evaluation of e-participation.

To address this methodological gap, a novel fit-for-purpose index, the DigiPartIndex, is introduced that places the emphasis on active digital participation processes rather than mere information-sharing[24, 5].

3. Theoretical framework and hypotheses

In the existing literature, there is a notable dearth of comprehensive theoretical frameworks addressing macro-level variables affecting the extent and depth of e-participation, particularly when viewed through the lens of the innovation producer [17]. However, innovation diffusion theories offer a relevant framework for comprehending the factors that shape the adoption and implementation of digital innovations, such as digital governance systems. We more especially draw on Tornatzky and



Notes: Adapted from [25].

Figure 1: The TOE model applied to the specific case of e-participation.

Fleischer's Technology-Organization-Environment (TOE) theory which posits that the introduction of new technologies within a public organization is influenced by three interdependent contextual components: Technology (T) that focuses on the availability and level of development of the technological infrastructure, Organization (O) that considers organizations' internal capacity to implement new technologies, and Environment (E) that further looks at external factors that might affect innovation adoption processes [25].

The Technology-Organization-Environment (TOE) model thus serves as a framework for dissecting the intricate web of factors that can sway a government's inclination toward the implementation of e-participation initiatives within a country. Utilizing insights from the field of e-government studies, we have identified three principal factors that jointly contribute to distinguishing between early and late adopters of e-participation systems. As depicted in Figure 1, factors encompass the quality of a country's ICT infrastructure (technology), the characteristics of its institutional structure (organization), and the broader socio-economic context in which it operates.

On the technological front, we argue that the overall quality in a country-wide ICT infrastructure emerges as a pivotal determinant of e-participation implementation by national governments [26, 27]. The theory of infrastructure-led development suggests that well-developed infrastructure can stimulate economic activities and innovation [28]. Applying this reasoning to the specific case of e-participation, it is thus expected that sound and accessible digital infrastructure within countries contribute in shaping governments' digital transformation readiness and maturity [17]. Accordingly, we develop the following first hypothesis: *H1. The presence of high-quality ICT infrastructure within a country is positively correlated with a heightened availability of digital governance systems.*

Moving into the organizational realm, we assert that institutional arrangements also wield substantial influence over a government's inclination and capability to embrace digital political participation [29]. The way in which authority is exercised in a country indeed mirrors national government's proclivity for fostering open citizen engagement, in particular e-participation initiatives. In this perspective, we argue that countries where the State does not have the monopoly of government capabilities and where policymaking is more open to external stakeholders are more enclined to embrace e-participation tools designed to enhance civic engagement in the political and decision-making processes [30]. Accordingly we develop the following second hypothesis: *H2: An overall openness of the national government toward the involvement of external stakeholders in policymaking is positively correlated with a heightened availability of digital governance systems.*

Lastly, aspects pertaining to a country's broader socio-economic context are posited to further

influence the feasibility and desirability of digital political participation endeavors [31, 32]. The resource-based view theory (RBV) indeed posits that organizations can achieve and maintain a competitive edge by acquiring and leveraging resources, hence making it more capable and likely to successfully adopt innovations [33]. On the basis of this theoretical model, socio-economically more developed countries are said to typically have the financial resources needed to support the implementation of e-participation initiatives. Accordingly we develop the following third hypothesis: *H3. Higher levels of socio-economic development within a country are positively correlated with a superior availability of digital governance systems.*

4. Methods and data

In order to test hypotheses, we employ regression analysis as the primary method. We are aware of the limitations of this approach due to the low number of cases and therefore mainly revert to bivariate analyses. The latter allows to quantitatively examine the impact of the three factors (the quality of infrastructure, government openness and socio-economic development) on the availability of digital governance systems across 36 pre-selected countries[1] The raw data as well as results of additional multivariate regression analyses will be made available for the final version of this manuscript after the review process. In this study, our case selection methodology of using a stratified sample is designed to ensure a diverse representation of countries while considering three key dimensions: political freedom, economic development and population size. The rationale behind this approach is to explore the relationships between our variables of interest, including digital political participation, across a range of political and socio-economic contexts. Our initial selection criterion relies on the Freedom House Index, concentrating our investigation on countries falling within the ”free” and ”partly free” categories. The rationale for this choice is grounded in the assumption that a minimum level of political freedom is a prerequisite for meaningful digital political participation. This first step already reduces the number of countries remaining in the sampling population by roughly a quarter of all sovereign countries. Within the subset of ”free” and ”partly free” countries, we further refined our case selection based on GDP per capita and population size. These socio-economic indicators allow us to categorize countries into high-income, medium-income, and low-income brackets. Our goal here is to ensure a balanced representation of socio-economic development levels within both the ”free” and ”partly free” categories. The same applies for population size to ensure that high-, medium- and low-populated countries are represented in the sample. Within this 3x3 table, we made sure to select a set of countries from all nine cells, but also making pragmatic choices based on availability of country experts within the research team. Following this dual-tiered case selection methodology, an expert-based data collection took place between April and August 2023.

The DigiPartIndex serves as our primary measure to capture the dependent variable, namely the availability of digital governance systems on a national level[5, 34], and as a limitation excluding what is offered on a subnational level. Such a clear delimitation of the measurement on the availablitiy of digital governance systems on the national level is useful for testing further hypotheses incorporating the subnational level. However, this must be left for future work and can not be achieved here. The DigiPartIndex values range from 0 to 100 and consists of seven key indicators that measure various aspects of digital political participation, putting specific emphasis on the participatory component of such processes. The indicators are grouped into three dimensions:

1. Opinion Formation – this dimension includes three different indicators, namely e-discussion (discussion), e-education (learning) and e-transparency (monitoring)

[1]Argentina (ARG), Australia (AUS), Austria (AUT), Belgium (BEL), Bhutan (BTN), Brazil (BRA), Bulgaria (BGR), Canada (CAN), Cape Verde (CPV), Côte d'Ivoire (CIV), Estonia (EST), France (FRA), Georgia (GEO), Germany (DEU), Ghana (GHA), Hungary (HUN), India (IND), Indonesia (IDN), Italy (ITA), Jamaica (JAM), Japan (JPN), Kosovo (XKX), Madagascar (MDG), Morocco (MAR), New Zealand (NZL), Palau (PLW), Senegal (SEN), Serbia (SRB), South Africa (ZAF), South Korea (KOR), Switzerland (CHE), Taiwan (TWN), Togo (TGO), Tunisia (TUN), United Kingdom (GBR), United States (USA).

2. Co-Creation – this dimension encompasses two indicators that are e-consultation (consulting) and e-demand (expressing views).
3. Decision-Making – this dimension is also comprised of two indicators namely e-ID (identification) and e-voting (elections and referendums).

Each indicator is rated on a 5-point scale. Bonus and malus adjustment points are applied based on factors such as use, usability, inclusiveness, and variety to enhance accuracy. Scores are then aggregated within and across dimensions using the arithmetic and geometric means, respectively (similar to the Human Development Index). Finally, index scores can be aggregated into five levels: very low (0-19), low (20-39), medium (40-59), high (60-79), and very high (80-100), potentially facilitating more qualitative cross-country comparisons and in-depth analysis.

To operationalize the first independent variable, which evaluates the quality of a country's nationwide Information and Communication Technology (ICT) infrastructure, we employed two distinct variables. The first indicator draws data from the World Telecommunication and ICT Indicators Database which supplies information on the percentage of a country's population utilizing the internet[2]. This metric serves as a proxy for the extent and accessibility of ICT infrastructure within a given nation, reflecting the level of internet usage among its citizens. The second indicator utilized is the UN E-Government Development Index (EGDI) designed to measure a country's overall e-government readiness and performance[3]. By incorporating the EGDI, we aimed to capture a comprehensive picture of a country's ICT infrastructure, not only in terms of internet usage but also in terms of its broader e-government capabilities.

To operationalize the second independent variable, which assesses the overall openness of policymaking processes to external stakeholders, we utilized two distinct variables.The first variable employed is the Freedom House index that measures the level of political rights and civil liberties within a given country[4]. This index is grounded on the assumption that countries with higher scores, indicating greater political freedom, are inherently more receptive to the engagement of non-state actors in the policymaking process. The second variable we utilized is the V-Dem participatory democracy index that gauges the extent of participatory democracy within a constituency[5].

To operationalize our last independent variable of "socio-economic development," we utilized a combination of two variables. First the GDP per capita variable provides an estimate of the average income or economic output per person within each nation[6]. A higher GDP per capita is indicative of greater socio-economic development, as it suggests a higher standard of living and overall economic prosperity for the population. The metric is supplemented by population size to get a more informed assessment of a country's socio-economic landscape. By incorporating GDP per capita together with population as our operationalization method, we aimed to capture and quantify the level of socio-economic development across different countries, considering both the overall economic output and the distribution of wealth among the population.

We furthermore introduced two additional control variables to better understand the factors influencing governments' willingness and capacity to implement e-participation initiatives. Human capital has been identified in existing literature as a significant factor in this context assuming that such participation is possible only when the citizens display sufficient learning skills and knowledge capabilities [16]. Hypothesizing that younger populations tend to display higher levels of human capital when it comes to digital savviness, we therefore included the age distribution within countries as a control variable[7]. Another control variable we introduced is the structural form of government,

[2]Worldbank, "Internet users", World Telecommunication/ICT Indicators Database, 2018, accessed September 26, 2023
[3]United Nations, "E-Government Development Index 2023," UN E-Government Development Index, 2023, accessed September 26, 2023
[4]Freedom House, "Global Freedom scores", Global Freedom Status, 2021, accessed September 26, 2021
[5]Vdem, "Democracy Report", Participatory Democracy Index, 2022, accessed September 26, 2021
[6]Worldbank, "GDP per capita", World Bank national accounts data, and OECD National Accounts data file, 2022, accessed September 26, 2023
[7]Worldbank, "Population ages 65 and above", United Nations Population Division: World Population Prospects, 2022, accessed September 26, 2023

specifically whether a country has a centralized or decentralized governance structure. We used the V-Dem Local Autonomy Index to operationalize this variable[8]. Our assumption is that unitary states typically have a more centralized governance structure, which may result in standardized e-participation policies and practices across the entire country. In contrast, federalized systems often allow for more decentralized decision-making, potentially leading to numerous e-participation initiatives being decided at the regional or municipal level rather than the national level. The various datasets used in this study pertains to the most up-to-date information accessible for all 36 countries examined in the present analysis.

5. Results

This section is structured into two subsections. First, we will present a descriptive overview of the DigiPartIndex score across the different investigated countries. In a second step, we will seek to explain the variance found for the DigiPartIndex in relation to the various macro characteristics previously outlined.

Using the DigiPartIndex to measure the availability of digital governance systems reveals significant disparities between countries (see Figure 2). At first glance, it is evident that the range is wide and that no nation reaches the higher value echelons. The Republic of Palau records the lowest DigiPartIndex value at 4 points, while Estonia leads the pack with 68 points. Notably, nine out of the 36 countries score below 20 points, classifying them as having "very low" levels of e-participation (Palau, Madagascar, Togo, Indonesia, Bhutan, the USA, Ivory Coast, Kosovo and Cape Verde). An additional twelve countries fall into the next category, denoting an overall low e-participation level (Jamaica, Senegal, Tunisia, Ghana, the UK, Georgia, Hungary, Serbia, India, South Africa, Argentina and Canada). Meanwhile, eleven other countries are classified in the middle category (Belgium, Switzerland, Italy, Japan, Marocco, Australia, New Zealand, Brazil, Austria, Taiwan, and Bulgaria). Topping the rankings with a DigiPartIndex score superior to 60 are only four nations: Germany, South Korea, France, and Estonia. Overall, two predominant trends emerge in terms of e-participation levels across countries: European (53% of the medium and high index bracket) and East Asian nations (20% of the medium and high index bracket) tend to exhibit higher levels of digital political participation, while African (37% of the low and very low index bracket), American (21% of the low and very low index bracket) and South Asian countries (10% of the low and very low index bracket) typically have lower average index scores.

In a next step, e-participation differences are correlated with three pivotal factors: socio-economic development (assessed through population and GDP levels), the quality of ICT infrastructure (evaluated by internet usage and the EGDI index), and the openness of the political system (gauged using Freedom House and V-Dem indices).

Figures 3 and 4 visually illustrate the relationships between digital political participation and the population and GDP per capita sizes of countries[9]. From our analysis of these bivariate regression results, several important insights emerge. At first glance, there seems to be a slightly positive link between a country's population size and its digital political participation. However, it is essential to emphasize that this association lacks statistical significance. This implies that the size of a nation's population, in isolation, does not offer a compelling explanation for the disparities in digital participation observed across countries. Conversely, regression analysis reveals a robust and highly significant positive connection between a country's GDP per capita and its availability of digital governance systems. This finding implies that countries with a higher GDP per capita, such as France, Germany, Estonia, or South Korea, generally tend to exhibit higher levels of digital political participation than countries with a lower GDP per capita, such as Madagascar, Togo, or Senegal. Although we do observe some notable outliers, such as the United States, which features a high GDP per capita but relatively low DigiPartIndex scores, or countries like Morocco, India, and Brazil, which display relatively high DigiPartIndex scores despite lower GDP per capita, our analysis underscores the significant influence of GDP per capita as

[8]Vdem, "Democracy Report", Local Government Index, 2022, accessed September 26, 2023

[9]Regressions were computed with the log values for population and GDP per capita.

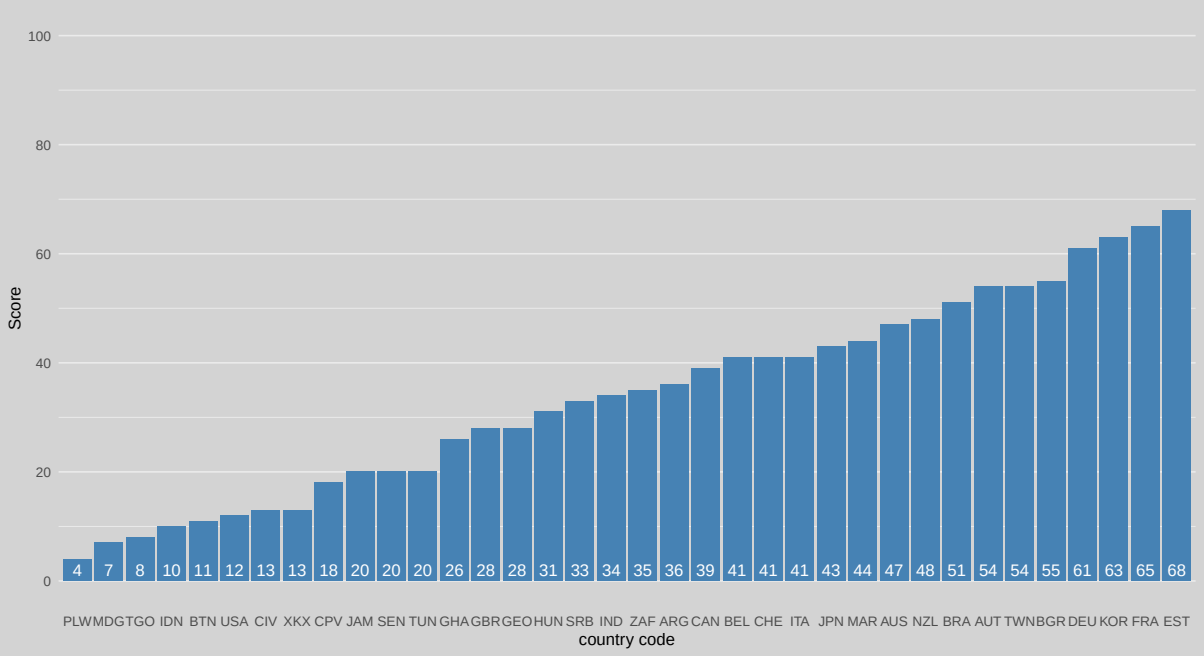


Figure 2: Overview over the overall DigiPartIndex scores of the 36 countries analysed

a determinant of digital participation levels across countries. In summary, our investigation reveals that countries' economic development emerges as a robust and influential factor in explaining the differences in the availability of digital governance systems across countries.

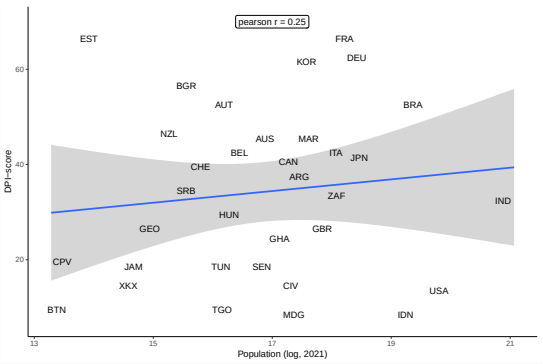


Figure 3: Population

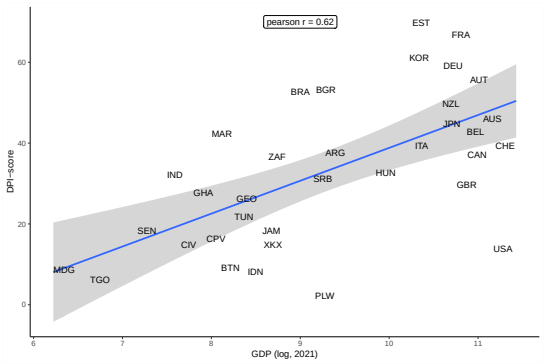


Figure 4: GDP

Figures 5 and 6 illustrate the connections between digital political participation and two key macro factors: Internet Use and E-Government Development scores. The bivariate regression highlights a statistically significant positive relationship between internet use and e-participation. This means that countries with higher rates of internet usage are more inclined to engage in e-participation efforts. In a similar vein, we find a strong and statistically significant positive correlation between the E-Government Development Index (EGDI) and digital political participation. This implies that countries with more advanced e-government infrastructures are more likely to engage in digital political participation. These bivariate analyses shed light on the digital participation landscape. Countries with high-quality ICT infrastructures such as South Korea, Estonia, France and Germany, tend to achieve higher index scores compared to countries with less developed ICT infrastructures, like Madagascar, Togo, or Ivory Coast. However, it is worth noting that the constant terms in both models lack statistical significance, suggesting that these factors alone may not be sufficient to drive digital participation.

Figures 7 and 8 illustrate the connection between e-participation and political rights, civil liberties, and

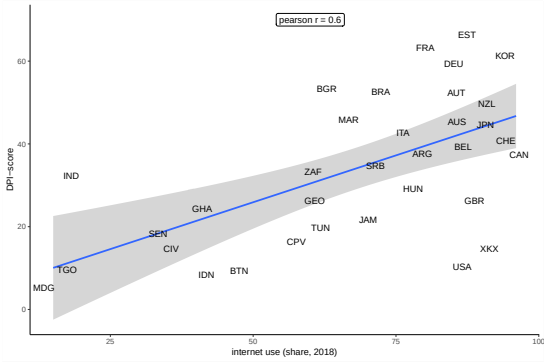


Figure 5: Internet Use

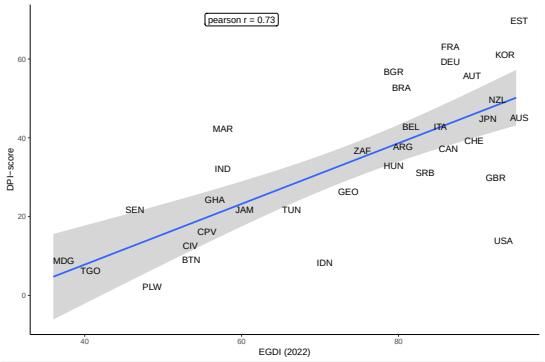


Figure 6: E-Gov according to EGDI

citizen participation in decision-making in various countries. There is a robust and positive relationship between a nation's degree of political freedom, as assessed by Freedom House, and its level of digital political participation measured by the DigiPartIndex. In this sense, countries characterized by higher levels of political freedom, such as Estonia, France, Germany, Austria, and Taiwan, tend to exhibit higher levels of digital political participation. In contrast, nations such as Togo, Ivory Coast, or Kosovo, characterized by more limited political rights and liberties, tend to have lower index scores. On the other hand, the correlation between the degree of direct democracy within a country and its e-participation level appears non-linear and lacks the statistical strength to be deemed significant. This means that unlike the condition of political rights and civil liberties, the degree of participatory democracy within a nation does not affect its propensity to deploy e-participation tools. In summary, despite the presence of some outliers, such as Morocco, which exhibits a relatively high index score despite lower political freedom, or Palau and the United States, where higher Freedom House scores do not translate to higher index scores for this measurement on the national level, it becomes evident that countries with more political freedom tend to demonstrate higher levels of digital participation.

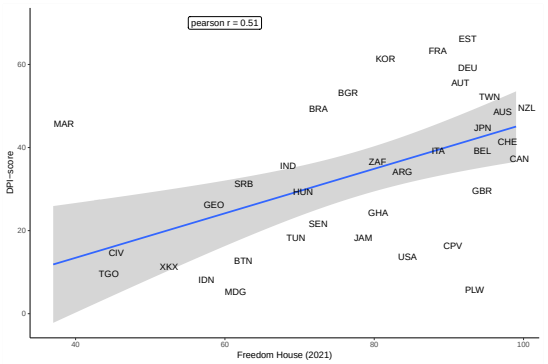


Figure 7: Freedom House

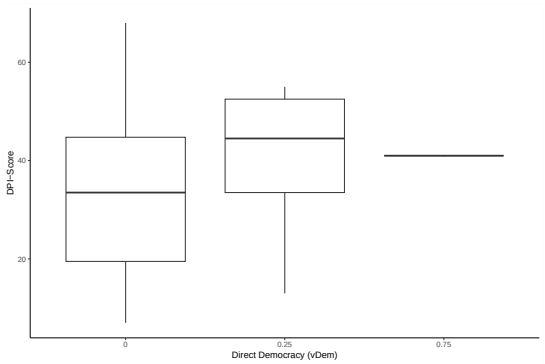


Figure 8: Direct democracy

Figure 9 illustrates the influence of centralization within a country's political system on digital political participation. It is intriguing to note that a higher degree of centralization, whether at levels of 0.25, 0.5, or 1, does not exhibit a statistically significant association with digital participation. This implies that variations in centralization levels do not strongly impact a country's engagement in digital political participation efforts. Figure 10 focuses on the age structure of a country's population in relation to digital political participation. Furthermore, countries with a more diverse age structure, encompassing a mix of younger and older citizens, tend to be more inclined toward digital political participation. This observation contradicts our initial hypothesis based on human capital, as countries with relatively younger populations tend to score lower on the index. One possible explanation is that low-income countries such as Togo, Madagascar, Senegal, Bhutan, or Ivory Coast tend to have higher concentrations of younger populations. It is thus important to bear in mind that these observations

are rooted in bivariate relationships and might evolve when considered alongside other variables in a multivariate analysis.

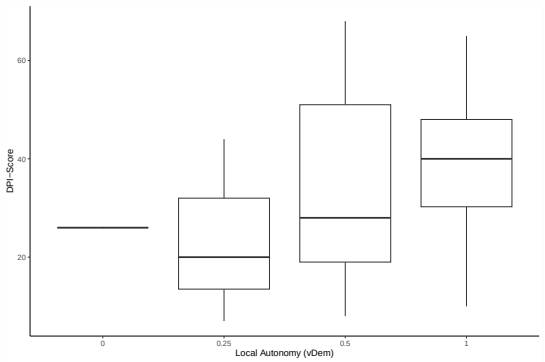


Figure 9: Local autonomy, centralization

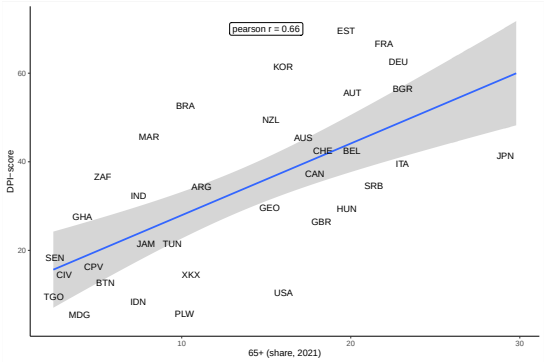


Figure 10: Age

Our bivariate analyses reveal that e-participation is the product of complex and multifaceted dynamics within a country, encompassing technological, organizational, and environmental factors. However at this stage, when taking into account multicollinearity, it appears that economic development emerges as the most influential explanatory factor in index scores. Countries with higher GDP per capita are indeed generally correlated with greater political freedom and typically exhibit more advanced ICT infrastructures. This connection is driven by the fact that more stable, economically developed nations have the resources to invest in education, infrastructure, and governance systems, which naturally support democratic governance and political freedoms. Moreover, this financial stability provides these countries with the means to invest in their ICT infrastructure, including e-participation initiatives, further contributing to the observed trends. In light of these findings, it becomes clear that economic development plays a central role in shaping e-participation, although as digital political participation continues to evolve on a global scale, the significance of financial resources may potentially diminish while other factors take on more prominent roles in influencing the level and extent of e-participation efforts.

6. Conclusions

The objective of this paper was to conduct a large-scale comparative examination of e-participation advancements among different nations. At first glance, it is evident that there are substantial disparities in the supply side of digital participation initiatives across countries. Our analysis has unveiled important insights into the factors underpinning these variations. Our bivariate correlations show that the level and extent of e-participation is conditioned by the complex interplay between macro-level technological, organizational and environmental factors. However, a single key factor emerges as the most influential in shaping index scores: economic development. As GDP per capita increases, so does a nation's capacity and propensity to engage in digital political participation, which confirms our third hypothesis. Economic development plays a pivotal role in shaping a country's ICT infrastructure, which is a cornerstone of successful e-government and e-participation endeavors. Beyond a nation's degree of political freedom, the influence of factors linked to government openness to civic participation, autonomy, or the social capital of its population currently seems to be relatively subdued. Nonetheless, as e-participation undergoes further global development and that countries at the back of the line are catching up, the significance of financial resources might dwindle, making way for other variables to assume an increasingly central role for the provision of digital political participation tools by governments.

While our bivariate regressions have shed light on the factors influencing e-participation, it is important to acknowledge that these insights may evolve when considered within more complex multivariate models. The broader significance of these parameters might experience shifts, uncovering

nuanced relationships that may not have been apparent in our initial bivariate analyses. Our research serves as an essential foundational step in understanding the macro-level dynamics that shape e-participation. Yet, the intricacies of this phenomenon call for further exploration. Future research endeavors should delve into more comprehensive multivariate investigations to provide a holistic understanding of e-participation's determinants. Additionally, broadening the scope of our research to encompass more countries beyond the initial 36 countries could provide a more extensive perspective on the determinants of e-participation, contributing to the ongoing discourse in this evolving landscape. Moreover, forthcoming studies could explore how these determinants evolve over time as digital political participation continues to develop on a global scale. This exploration may potentially unveil new influential factors as the quality of ICT infrastructure becomes more uniform across countries and financial resources become less pivotal.

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Declaration on Generative AI

The author(s) have not employed any Generative AI tools.

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