Democracy in the Age of Internet: Internet Freedom as an Early Warning Mechanism for Democracy Fluctuations

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Author's Declaration

I, the undersigned **Justina Vaikutyte** hereby declare that I am the sole author of this thesis. To the best of my knowledge this thesis contains no material previously published by any other person except where due acknowledgement has been made. This thesis contains no material, which has been accepted as part of the requirements of any other academic degree or non-degree program, in English or in any other language.

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Abstract

This thesis examines the relationship between the level of democracy, the quantity (the ratio of internet users in the country) and the quality (the internet freedom) of the internet in order to see how well the level of the internet penetration and internet freedom can predict the level of democracy. To analyze these complex relationships we have compiled a database from three different sources and performed a quantitative analysis using the data from the Polity IV project, Freedom House Freedom on the Net Reports and the World Bank development indicators. The results of the analysis suggest that that while the traditional measures of democracy such as the Polity IV can only capture relatively big changes in the level of democracy due to the limited number of categories in the scales of measurement, the internet freedom has a potential to predict minor democratic developments or declines before they are reflected by the conventional measures.

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1 Introduction

Twenty years ago less than 1% of the population had access to the internet connection. From 1999 to 2013 the number of internet users increased tenfold and today in 2015 we have more than 40% of the world population on the internet. Even though the internet penetration varies highly from country to country, the number of internet users continues to grow significantly faster than the number of people and the trend is likely to continue in the future (Number of Internet Users 2015). Since the internet became a mainstream phenomenon and irreversibly transformed the communication infrastructure, researchers have been wondering how would it affect political systems and, most importantly, the notion of democracy.

At the dawn of the internet era it was believed that the internet might not only drive economic progress and development, but also bring stronger and more participatory democracies. The development of the communication technologies and the internet in particular was seen as a vital component for the processes of democratization. The media system dependency theory developed by Rubin and Windahl suggests that the growing centrality and the number of the information delivery functions taken over by a certain medium, the internet in our case, increases the society's dependency on that medium and this tendency tends to grow over time and get even stronger over the times of instability and conflict (Groshek 2009). Since the internet diffusion has been growing at an unprecedented rate, it is important to study how the growing ratio of the internet users could be related to the democratic outcomes. Christopher Kedzie analyzed how ICT technologies and the internet in particular came to being as a driving force for democratization. In his macro-level study on the effects of the internet Kedzie found that in the early nineties when the internet was just kicking off, its diffusion was indeed a powerful predictor of democratization at the multinational level (Best and Wade 2009; Kedzie 1997). However, later studies found an interesting trend that even though the internet diffusion level could be a potential democratizing agent, it could not be viewed in the light of a technological determinism (Groshek 2009). Best and Wade (2009) in their study on the internet's effect on democracy found that even though the internet diffusion could have a positive effect on democracy, it is most likely to happen in the countries that are already developed and under the process of democratization (Best and Wade 2009). Their most interesting and provoking finding was that in the regions where the internet spread failed to promote democratic growth, it was hindered by governments imposing various restrictions not only on the physical access to the internet infrastructure but also using extensive censorship and content blocking mechanisms (Best and Wade 2009).

The findings of Best and Wade (2009) suggest that in the recent context where the internet has already reached an unprecedented ratio of users, not the quantity, but the quality of the internet might be more important. The new infrastructure brought by the internet has irreversibly changed the modes of information aggregation, broadcast, group dialogue and communication in general. Differently from telephony, radio, and television, the internet brought highly available and decentralized infrastructure enabling the convergence of different modes of communication and created an entirely new social space (Weare 2002).

The internet has far transcended the conventional means of communication and became the platform for deliberative and participatory democracy where the citizens can access the plethora of political information and communicate directly to their elected representatives or express their views and expectations on their governments. A lot of the political interaction online has even been organized into the virtual communities consisting of people sharing similar values, interests and concerns and those communities, let it be blogs, social media groups or dedicated websites, have become the space where individuals share and gather information about the political issues of their interest (Dahlberg 2001). The internet has become an entire new social space enabling individuals to exercise their democratic freedoms and duties online, with significantly smaller opportunity costs. However, with the great deliberative power for the people, the internet has also brought more power for the governments. A large fraction of the cyberspace is only relatively autonomous from the governmental affairs.

In 2009 the Freedom House organization well known for its significant work on monitoring the *freedom in the world*, a set of indicators considered to be the proxy measurement for democratic developments, introduced a new project to track the changes in the cyberspace. The Freedom House organization has been measuring three aspects of the internet freedom: obstacles to access, limits on content and violations of user rights imposed by the governments. These aspects are highly dependent on the institutional structure of the state since this indicator is based on the discussion of how governments can restrict access to the internet by blocking websites, limiting or censoring the content, or even using drastic means and limiting the freedom of speech and arresting the internet users that are violating the online rules set by the government (Kelly et al. 2014). Before the internet has kicked off, it was significantly harder for governments to shape the public opinion or put any restrictions on citizen's freedoms since it had to be done physically or by controlling the mass media. Now, when we have an entire new cyber social and political space, it takes a few clicks to put limitations on access and content. As the Freedom House has reported, the internet freedom index has been declining for the last four years with

more and more governments introducing restrictive laws on the internet access and content as well as more aggressive means of targeting users that do not follow the new regulations on the internet (Kelly et al. 2014).

There have been many studies on how the growing internet penetration levels could affect the democratization processes and the very functioning of the state regime, however there has been a lack of quantitative research targeting specifically the relation between the level of democracy (reflected by a particular score of a certain democracy indicator) and the quality of internet. In this paper by using the term the quality of internet we actually refer to the internet freedom, that has been measured and quantified by the Freedom House organization. Since the literature on the internet and democracy points out that the internet might have become a social space for the practice of democracy, we ask how well can internet freedom predict democracy and whether it can do it better than the level of the internet penetration. In this paper we will test the relationship between the level of democracy, the quantity (the ratio of internet users in the country) and the quality (the internet freedom) of the internet and see how far level of the internet penetration and internet freedom can predict the level of democracy.

2 Theoretical Framework

Before tackling the actual relationship between democracy, internet penetration and internet freedom we have to make sure what we mean by the level of democracy. In the following section we will discuss the problem of democracy conceptualization and then proceed to building the conceptual framework that would enable to test the relationship between democracy, internet penetration and the internet freedom and how these indicators could be employed for monitoring fluctuations in the democracy scores.

2.1 Conceptualization and Measurement of Democracy

The concept of democracy has been around since the ancient Greek times, nevertheless, if we had a chart for the most debated concepts in the history of the social sciences, democracy would most likely hit the top 3. If we put the concept of democracy in general terms, it would probably refer to a rule by the people. One might also point to a degree of sovereignty, where a polity in order to be considered a democracy should have a degree of self-government. However, since democracy is such a broad and complex phenomenon, the debates over conceptualization and measurement go way beyond the above mentioned core definitional elements (Coppedge et al. 2011).

The scholarly literature on the conceptualization and measurement of democracy could be broadly divided into two main camps: either treating democracy as a dichotomous variable (democracy/non-democracy) and conceptualizing it in strictly procedural minimal terms or measuring democracy on a continuous scale where a polity can be more or less democratic and conceptualizing it more substantively (Bogaards 2012; Cheibub, Gandhi, and Vreeland 2009). A good example of a

dichotomous democracy conception is a Democracy-Dictatorship measure (DD) developed Cheibub, Gandhi and Vreeland (Cheibub, Gandhi, and Vreeland 2009) where a polity qualifies as a democracy if it can fulfill the necessary and sufficient conditions. This conceptualization implies that democracies and dictatorships are fundamentally different and it does not make sense to measure them on the continuous scale. In other words, they claim that there can be no such situation where a regime is equally democratic and dictatorial at the same time (Clark, Golder, and Golder 2013). Minimalist definitions having a small number of attributes enable to study a variety of empirical questions and instances, however it does not come without problems. If a concept is so minimalist that every instance can become a case, it is necessary to add a number of attributes to balance out the concept so that it represents the theory well and is flexible enough.

On the other hand there are more substantive or maximalist conceptualizations of democracy that perceive institutions and other attributes as necessary but not sufficient conditions to qualify a certain regime as a democracy or and autocracy/dictatorship. Maximalist conceptions of democracy tend to add various definitional attributes that are not necessarily directly related to the main concept. For example, the Freedom House organization has created a Freedom House Index (FHI) to measure the institutions of democracy in terms of global freedom (Denk 2013). It has included a wider list of attributes related to other concepts such as social welfare or rule of law. The Freedom House democracy score is based on two dimensions capturing political rights and civil liberties in the country and main assumption of this measure is that democracy is a synonym of freedom. The FHI index uses a continuous scale of democracy and dictatorship ranging from free (democracy) on one end to not free (dictatorship) on the other (Giannone 2010). While the FHI index has

incorporated a maximalist approach to measuring the procedural concepts of freedom and democracy it has become one of the most commonly used measures for comparative research on political regimes and democratic institutions and it has contributed significantly to today's understanding of the conditions for democratic systems (Denk 2013). However, a maximalist concept definition that might include too many attributes can compromise an empirical reference and analytical use of the actual concept (Munck and Verkuilen 2002). In case of Democracy there is countless number of concepts and indicators to be attributed to it thus it is necessary to limit the number of them to construct a meaningful model. Measurement of such a wide concept as democracy requires a balanced approach thus it is important to be guided by theory on one hand but also be cautious about its attributes in order to create consistency of the evidence (Coppedge et al. 2013).

One of the most significant scholars in the area of democracy research, Robert Dahl, has worked out the minimalist concept of democracy in terms of institutions crucial for the democratic process (Denk 2013). He believed that it is nearly impossible to find examples of pure real world democracies so he suggested employing a minimalist, or in other words procedural approach towards democracy and chose to analyze only institutions and procedures rather than outcomes of political regimes. He proposed two dimensions - contestation and inclusion. Contestation was related to the procedural workings of democratic competition and inclusion was meant to measure participation in a democratic processes (Clark, Golder, and Golder 2013).

In this paper to build the working definition of democracy we will use Dahl's conceptual framework and organize our data around the two conceptual dimensions: contestation and inclusion. The democracy measurement tool that has managed to find a balance between minimalist and maximalist definitions proved to be the Polity

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IV project that was based on coding the authority characteristics of states and aimed at facilitating quantitative and comparative analyses. The unit of analysis in this project is *polity* referring to as an institutionalized authority pattern characterizing states that are the most formal type of polities within the world's state system (Marshall, Gurr, and Jaggers 2014). Polity IV democracy measure follows Dahl's approach to measuring democracy on a single continuous scale. It is based on a rather minimalist conceptualization since it includes six main attributes for procedural measurement and does not address outcomes (Clark, Golder, and Golder 2013).

To organize the Polity IV project democracy measurement indicators we followed a conceptualization structure proposed by Munick and Vercuilen in their paper on Conceptualizing and Measuring Democracy (Munck and Verkuilen 2002). They came up with an idea that it is logical to build a conceptual framework by organizing the attributes of a concept by the level of abstraction. Generally this task would affect the process of data gathering and generation, however, since we already had a substantial database created by the Polity IV project team, we only organized the already existing indicators following the logic of the different levels of abstraction.

At the most disaggregate level the Polity IV uses six categorical indicators to construct the final aggregate measure for democracy – the Polity2 score, ranging from -10 (least democratic) to 10 (most democratic). The six ordinal indicators can be sorted into three categories that define the concept variables of the Polity2 score. The concept variables are coded by aggregating the information from the concept component variables so there is no substantial loss of information when we move between the different levels of abstraction. The Polity2 score is aggregated from the values of the concept component variables and usually a one unit increase in any of

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the concept component variables generate an increase in the Polity2 score (Treier and Jackman 2008).

Munick and Verkuilen proposed a model for conceptualizing democracy at two levels of abstraction that goes as following: concept, attributes and components of attributes. The model could go down the levels of abstraction as far as we want to disaggregate the main concept (Munck and Verkuilen 2002).

Going in line with Dahl's approach we organized the polity IV project indicators into two main conceptual dimensions: contestation and inclusion. The contestation dimension in Dahl's conception captures the notion of who gets to formulate the political processes, how the leaders are chosen and how citizens can influence their decisions (Clark, Golder, and Golder 2013). Since the Executive Recruitment variable in the Polity IV dataset refers to the ways in which the representatives come to occupy their positions and the Executive Constraints concept variable refers to constraints that could be imposed by any accountability groups on the executive decision-making process, we attributed these concept variables to the contestation conceptual dimension. The inclusion dimension captures which groups are included in the democratic processes while contesting and controlling the government (Coppedge, Alvarez, and Maldonado 2008; Clark, Golder, and Golder 2013). We attributed the Political Competition and Opposition concept variable to this dimension because it refers to the extent to which the various political systems enable their citizens (nonelite) to influence the political decisions by acts of participation (Marshall, Gurr, and Jaggers 2014). The entire conceptual framework is presented in the Figure 1 below.

Figure 1. The conceptual framework of the measurement of democracy.



The methodology of gathering and coding the data for the Polity IV project database enables to analyze the Polity2 score and its attribute indicators at three different levels of abstraction and therefore to test the prediction potential of the Internet Freedom at all the available levels of conceptual aggregation. Democracy is a very broad general concept and simply asking whether an additional predictor can forecast the aggregate score gives very little practical information. Therefore the ability to analyze democracy at the different levels of conceptual aggregation enables to see the more nuanced relations between the concept and potential predictors of its empirical values assigned during the process of measurement and aggregation.

In this paper we will test the relationship between the concept of democracy, internet penetration and internet freedom empirically by performing a quantitative analysis of the data pooled from different sources. By measuring the strength and the direction of the relationship between the variables at the different levels of aggregation we will tackle the question of how well does the internet penetration level and the internet freedom predict the level of democracy and whether the internet freedom is a more reliable predictor than the internet penetration. The Figure 2 below summarizes our main research question ant the hypothesized relations between the variables.

Figure 2. The relation between the internet penetration, internet freedom and democracy.



3 Methodology

3.1 The Database

The database for the analysis of the relationship between the democracy score, internet penetration and internet freedom has been semi-manually compiled by integrating the data from three different sources:

- Polity IV project Annual Time-Series 1800-2014 database (Center for Systemic Peace 2014);
- Freedom House "Freedom of the Net" reports for the years 2011-2014 (Kelly and Cook 2011; Kelly, Cook, and Truong 2012; Kelly et al. 2013; Kelly et al. 2014);
- World bank dataset on Internet users per 100 people, GDP and population size (The World Bank 2015).

The main structure of the dataset was based on the observations from the Polity IV project.

3.2 Indicators

The indicators chosen for the analysis correspond with the theoretical framework presented above.

3.2.1 Dependent variables

3.2.1.1 Level of aggregation: concept

Polity2 (interval); N=167

Polity2 refers to a revised combined Polity score. It is an aggregate indicator computed by subtracting Autocracy and Democracy scores. The original version from

the Polity IV project measures autocracy and democracy of the regime on a continuous scale that ranges from -10 (strongly autocratic) to 10 (strongly democratic) (Marshall, Gurr, and Jaggers 2014). For the purposes of regression analysis and interpretation the scale of this variable was transformed to a positive 21 point scale ranging from 0 (strongly autocratic) to 20 (strongly democratic).

3.2.1.2 Level of aggregation: Concept Variables and concept component variables

- Executive Recruitment (ordinal); N=167
 - Regulation of Chief Executive Recruitment (ordinal)
 - Competitiveness of Executive Recruitment (ordinal)
 - o Openness of Executive Recruitment (ordinal)
- Executive Constraints (ordinal); N=167
- Political Competition and Opposition (ordinal); N=167
 - Regulation of Participation (ordinal); N=167
 - Competitiveness of Participation (ordinal); N=167

The measurement scales of the concept variables and the concept component variables will be defined in more detail in the Analysis and Findings section below.

3.2.2 Main independent variables

Internet Freedom (interval); N=58

The original Internet Freedom score measures the level of internet and digital media freedom in 65 countries (2014). Each country receives a numerical score from 0 (the most free) to 100 (the least free), which serves as the basis for an internet freedom status designation of free (0-30 points), partly free (31-60 points), or not free (61-100 points). Ratings are determined through an examination of three broad categories:

obstacles to access, limits on content, violations of user rights (Kelly et al. 2015). For the purpose of the analysis and interpretation, the indicator scale has been reversed thus in this paper the internet freedom is measured on the scale from 0 to 100 where 0 is the least free and 100 is the most free.

Internet Freedom Status (ordinal); N=58

In this paper we use various statistical methods for different types of variables and specifically for cross tabulation and measurement of association we have also use the Internet Freedom status as an ordinal variable having three categories: 1) Free (original internet freedom score 0-30); 2) Partly Free (original internet freedom score 31-60); 3) Not Free (original internet freedom score 61-100).

Internet Penetration (Internet Users per 100 people) (interval); N=167

Internet users are people with access to the worldwide network (The World Bank 2015). The scale is from 0 to 100, reflecting the proportion of internet users per capita. This variable represents the internet penetration thus the names Internet Users per 100 people and Internet Penetration are used interchangeably in this paper.

Internet Penetration (ordinal); N=167

To minimize the number of categories and make the interpretation and comparison easier for the cross-tab analysis and measurement of association we also computed the Internet Penetration variable in the same manner as the Internet Freedom Status. The has 3 categories: 1) high internet penetration (61-100 internet users per 100 people); 2) medium internet penetration (31-60 users per 100 people); 3) - low internet penetration (0-30 internet users per 100 people).

3.2.3 Control independent variables

In order to see more accurate relationships between dependent and independent variables we decided to include additional control variables for the bivariate correlation and multiple regression analyses. Controlling for the size of the economy and the size of the population will help to crystalize the effects of the main independent variables (Internet users per 100 people and Internet Freedom) on the dependent variables (Polity2 and its concept variables).

Size of the Economy: GDP (interval); N=167

GDP (current US\$) at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products (The World Bank 2015).

Population Size (interval); N=167

Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship, except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. The values are midyear estimates (The World Bank 2015).

3.2.4 Time lag

Studies on internet's impact on certain policies or democracy scores in more general terms tend to select the time-lag of one year to avoid the problem of error correlation and also to account for the time needed for independent variables to actually take effect (Groshek 2009; Hawkins and Hawkins 2003; Guillén and Suárez 2005). Since the combined dataset represents the observations of all the variables during the four year period (2011-2014) In this paper the dependent variables used for

correlations, cross tabulation and regression analysis will be lagged one year. To analyze the latest developments, mainly the observations from the years 2013 and 2014 will be used interchangeably, depending on which variables are going to be considered as dependent and independent. In other words, we will analyze the effect of internet freedom and internet penetration variables from 2013 on the Polity2 scores and its component variables from 2014. Consequently, the control variable observations will be from 2013.

3.3 Analysis methods

Correlation

Correlation tests will be run to define the relationship between the independent and dependent variables at the highest level of conceptual abstraction. Pearson's correlation coefficient will be used as a measure for the strength and direction of the relationship between the variables.

Crosstabulation and Measures of Association

Crosstabulation and measures of association will be used to analyze the relationship between the concept component variables and the internet freedom status indicator at the highest level of conceptual disaggregation. We will use the Chi-square test to estimate the statistical significance of the relation between the variables and the Cramer's V coefficient to test the strength of the relationship between the ordinal and nominal variables.

Multivariate regression

We will use the multivariate regression to analyze the relationship between the dependent and independent variables at the concept and concept variable levels of

conceptual abstraction. We will build the regression models to determine whether our independent variables have statistically significant independent effect on the dependent variables (Polity2 and its concept variables).

4 Analysis and Findings

4.1 Internet Quantity vs. Internet Quality. Which one Predicts Democracy Better?

This chapter will tackle the question of which additional predictor of democracy is more reliable and whether the Internet Freedom indicator can predict the polity2 or in other words democracy score better than the Internet Penetration. To control for the additional factors that might have an effect on the democracy score we will include GDP and the population size variables in the following multivariate regression models.

4.1.1 Aggregation level: Concept

We will start the analysis at the highest level of conceptual aggregation (see Figure 3 below) and see what is the relationship between the main concept variable (democracy that is represented by the Polity2 score) and the independent variables of Internet Penetration and Internet Freedom. If our main hypothesis is correct, Internet Freedom should be a reliable predictor of the aggregate Polity2 score and the Internet Penetration should not have any significant effect on the main concept variable.

Figure 3. Levels of conceptual aggregation: concept.



The first step is to check whether there is linear relationship between the main concept variable (Polity2) and the two predictors (Internet Penetration and Internet Freedom). We conducted correlation tests with fitted line to see whether the concept variable and its potential predictors move together and if they do, whether this tendency is statistically significant.

4.1.1.1 More Internet

In this paper by saying more internet we imply the higher internet penetration, or in other words, higher number of internet users per 100 people in the country. The bivariate correlation test showed that there is a very weak correlation between the level of internet penetration and the aggregate polity2 score (Pearson Correlation .276^{**}). The scatter plot with a fitted line further confirmed that the linear relationship

^{**} Correlation is significant at the 0.01 level (2-tailed).

between the two variables is very weak and it could explain only a small fraction of the entire variation (r^2 =.076). It means that contrary to the former beliefs, the number of internet users might have ceased to be a reliable additional predictor for democracy, at least at the aggregate conceptual level.

4.1.1.2 More Internet Freedom

Since we already got some evidence on the effect of quantity of the internet on the Polity2 score, it is also important to analyze the quality part and to see what is the relationship between the internet freedom and the Polity2 score. The bivariate correlation test showed an extremely high statistically significant correlation between the Polity2 score and the Internet Freedom score (Pearson Correlation .819**). The positive correlation coefficient means that more internet freedom might indeed mean higher Polity2 score and thus more democracy. In the scatter plot (see Figure 4 below) we can actually see how the two variables correlate together; the higher the Polity2 score, the more internet freedom.

Figure 4. Scatter plot of Polity2 and Internet Freedom score.



4.1.1.3 More Internet and More Internet Freedom

So far we saw that while there is a very weak linear relationship between the internet penetration (quantity of the internet) and the Polity2 score, the relationship between the internet freedom (quality of the internet) and the Polity2 score seems to be very strong. To be able to analyze the relationship between the main concept variable and its potential predictors in more detail, we built a multivariate regression model.

Since we want to find out which predictor of democracy is more reliable, in the regression model we put Polity2 score as a dependent variable, Internet Penetration (Number of Internet Users per 100 People) and Internet Freedom as independent

variables. We also added GDP and population size as control independent variables to check if they do not retract the significance of our chosen democracy predictors in the model.

Dependent variable: Polity2							
Independent variables	В	Anova sig.	R Square				
Internet freedom	.287**						
Number of internet users per 100 people	022	.000	.672				
GDP	2.923E-19						
Population Size	4.548E-9						

Table 1. Multivariate regression at the aggregate concept level.

** Regression coefficient is significant at the 0.001 level.

* Regression coefficient is significant at the 0.01 level.

As we see in the Table 1 above, the only the only independent variable that has a statistically significant effect on the Polity2 score is the internet freedom. The regression model shows that while holding other independent variables constant, the internet freedom is significantly related to the Polity2 score and the number of internet users as well as GDP and population size have no significant linear effect.

The multivariate regression analysis suggests that at the aggregate conceptual level more internet freedom could actually mean more democracy if we interpret the aggregate Polity2 score as a proxy measurement for democracy. To be more precise, if the Internet Freedom score would increase by one point or 1% (while holding other variables constant), the polity2 score would also increase by 0.287 points or by approximately 1,37%¹.

The multivariate regression analysis confirmed that when controlling for the internet freedom, GDP and the population size, the ratio of the internet users has no significant effect on the Polity2 score, while the other way around, when controlling

¹ We transformed the scales of the Polity2 and the Internet Freedom variables for the purpose of the interpretation thus the positive regression coefficient implies that the higher the score of the Internet Freedom, the higher the score of the polity2.

for the ratio of the internet users, GDP and the population size, the internet freedom has a significant effect on the Polity2 score.

Analysis at the highest concept aggregation level demonstrated that while the number of internet users, or in other words the quantity of internet is not a reliable predictor of an aggregate Polity2 score, the Internet Freedom score is strongly related to the Polity2 score. It means that the Internet Freedom indicator might be a valuable additional predictor for democracy, especially in the digital era with the number of internet users growing higher then the number of people.

At the highest level of the conceptual aggregation we can confirm the assumption that the Internet Freedom is a more reliable predictor of democracy than the Internet Penetration. However, it is necessary to analyze this statement further and see whether the Internet Freedom score has any significant relationship with the different components of the polity2 score. While at the aggregate conceptual level the relationship between the Internet Freedom and the polity2 score might be very strong, it is also important to check how the relationships between the variables unfold when we move down the ladder of the conceptual aggregation. The same holds true for the ratio of the internet users; to confirm the assumption that it is not a reliable predictor of democracy, we have to check whether the trend of the very weak or no relationship between internet penetration and Polity2 score continues when we disaggregate the main concept variable into smaller concept component variables.

This chapter will further continue with the analysis of different levels of aggregation for both, Internet Freedom and Polity2 and see whether the quantity and quality of the internet has an effect on contestation and inclusion dimensions of democracy, its concept variables, and the concept component variables.

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4.1.2 Aggregation level: Conceptual Dimensions and Concept Variables

As mentioned in the conceptual framework above, the Polity2 measure corresponds with Dahl's conception of democracy. While the Polity2 measure operates at the highest conceptual level of aggregation and can be regarded as a proxy measure for democracy, it is also interesting to analyze its concept variables that are related to the two principal components of democracy and their relationship with the internet penetration and the internet freedom.

4.1.2.1 Contestation

To test whether there is a linear relationship between the internet penetration and the democracy contestation dimension as well as between internet freedom and contestation, we will again run a number of bivariate correlations to see if there is any linear relationship between the variables as well as bivariate and multivariate regressions to analyze the relationships between the dependent and independent variables in more detail. The models will help to test the hypothesis that the internet penetration is not a reliable predictor for conceptual components of democracy anymore as well as further analyze the relationship between the internet freedom and democracy at the disaggregate level of measurement.

The Figure 5 below represents our conceptual framework and, particularly for this section, how Polity2 concept variables are related to the contestation dimension of democracy (see boxes highlighted in grey in the figure below).



Figure 5. Conceptual aggregation level: concept dimensions and concept variables.

The dependent concept variables tested under the contestation dimension are:

- *Executive Recruitment*. Defined on the scale from 1 to 8, where (1) means no elections (hereditary succession) and (8) means competitive elections (Coppedge et al. 2015).
- *Executive Constraints*. The degree of checks and balances between the various parts of the government is coded on a 7-point scale which ranges from "unlimited executive authority" (1) to "executive parity or subordination" (7) (Coppedge et al. 2015).

4.1.2.1.1 Quantity of Internet

We already saw that at the aggregate level the relationship between the quantity of internet (number of internet users per 100 people) and Polity2 score was very week

thus now we will test whether the results are consistent at the different levels of conceptual aggregation.

The bivariate correlation test showed that there is a very weak correlation between the Internet Penetration and the Executive Recruitment (Pearson Correlation .169^{*}). The correlation coefficient between the Internet Penetration and the Executive Constraints happened to be a bit higher (Pearson Correlation .335^{**}), however still not sufficient to show a fairly strong relationship between the two variables.

4.1.2.1.2 Quality of Internet

Even at the higher level of disaggregation the quality of internet again proved to have a stronger relationship to both dependent variables than internet quantity. The bivariate correlation test showed a very high correlation coefficient of the internet freedom with the Executive Recruitment (-.727**) as well as Executive Constraints (-.779**).

4.1.2.1.3 Quality and Quantity of Internet

In order to find out whether the Internet Penetration and Internet Freedom have an effect on the contestation dimension and its concept variables independently from each other we also performed a multivariate regression analysis. For the concept variable regression models we used the same independent and control variables as in the aggregate concept model above; Internet Freedom and Number of Internet Users per 100 People as the main predictors, GDP and Population size as the control variables.

^{*} Correlation/regression coefficient is significant at the 0.05 level.

^{**} Correlation/regression coefficient is significant at the 0.01 level.

Table 2. Multivariate regression at the concept variable level.

	Model 1 DV1: Executive Recruitment	Model 2 DV2: Executive Constraints	Model 2.1 DV2: Executive Constraints
Internet freedom	.093**	.084**	-
Number of internet users per 100 people	010	005	.023**
GDP	106E-19	5.157E-20	3.6454E-19
Population Size	1.685E-9	1.946E-9*	-1.901E-10
Anova sig.	.000	.000	.000
R Square	.539	.645	.126

Consistently with earlier analysis at the aggregate level, the regression models suggest that Internet Freedom is also a reliable predictor of the concept variables of the contestation dimension of the democracy. As for predicting the score of the Executive Recruitment indicator, the Internet Freedom is the only independent variable having a statistically significant linear effect on the dependent variable. The Model 1 (see Table 2 above) explains more than half of the variation and suggests that while holding the Internet Penetration, GDP and the Population Size constant, an increase of the Internet Freedom score by one point or 1% would also increase the score of the executive recruitment by 0.093 units, or by approximately 1.16%.

The second model (see Model 2 in the Table 2 above) shows that the Internet Freedom also has a significant linear relationship with the Executive Constrains variable. While holding other independent variables constant, one additional point or 1% in the Internet Freedom index corresponds to 0.084 or 1.2% increase in the Executive Constraints variable. The second model also suggests that not only the Internet Freedom but also the Population Size has an effect on the Executive Constraints and both variables explain almost 65% of the variation. To see if the Internet Freedom could explain the variation of the Executive Constraints more systematically than the Population Size we removed the Internet Freedom from the model (see Model 2.1. in the Table 2 above). It turned out that without the Internet Freedom our regression model could only explain 12% of the variation and also the Population Size lost its significance (see Model 2.1 in the Table 2 above).

The multivariate regression analysis suggests that at the concept variable aggregation level Internet Freedom has a statistically significant relationship with both concept variables that belong to the contestation dimension. Nevertheless, our regression models did not show any significant linear relation between Internet Penetration and contestation dimension concept variables while holding other independent variables constant.

4.1.2.2 Inclusion

The dependent concept variable tested under the inclusion dimension is:

Political Competition and Opposition. Defined on scale from 1 to 10, where
 (1) is repressed competition and (10) is institutionalized open electoral participation (see the Figure 6 below).



Figure 6. Conceptual aggregation level: concept dimensions and concept variables.

4.1.2.2.1 Quantity of Internet

The bivariate correlation analysis again showed that the correlation between Political Competition and Opposition concept variable and the Internet Penetration, even though statistically significant, is very weak (Pearson Correlation .265**).^{**}

4.1.2.2.2 Quality of Internet

In the inclusion dimension Internet Freedom demonstrated even higher correlation coefficient than in the contestation dimension (Pearson Correlation .830**).

4.1.2.2.3 Quality and Quantity of Internet

To further test the bivariate correlation results presented above, we built another multivariate regression model where the dependent variable is Political Competition

^{**} Correlation is significant at the 0.01 level (2-tailed).

and Opposition, the independent variables are Internet Freedom and Internet Penetration (Number of Internet Users per 100 People) and other control variables are GDP and Population Size.

Dependent variable: Political Competition and Opposition							
Independent variables	В	Anova sig.	R Square				
Internet freedom	.133**						
Number of internet users per 100 people	013	.000	.672				
GDP	5.800E-19						
Population Size	1.207E-9						

Table 3. Multivariate regression at the aggregate concept level.

** Regression coefficient is significant at the 0.001 level.

* Regression coefficient is significant at the 0.01 level.

Consistently with the correlation test results, the only independent variable having statistically significant effect on the Political Competition and Opposition holding other variables constant is Internet Freedom index (see Table 3 above). The third model has the highest prediction potential since it explains 67% of the variation. One point or 1% increase in the Internet Freedom index corresponds with 0.133 points increase or 1,33% increase of the Political Competition and Opposition variable.

Analysis of the disaggregated dimensions of polyarchy showed that while Internet Freedom proved to have a very strong relationship to polyarchy concept variables, even at the disaggregated level of measurement, we did not detect any strong relationship between the Internet Penetration and concept variables of polyarchy. Since the Number od Users per 100 People - the indicator for the quantity of the internet - did not prove to have any significant linear relationship to the main concept and the concept variables, further analysis will focus on the Internet Freedom and its relationship with democracy concept component variables at the highest level of the conceptual and measurement disaggregation.

4.1.3 Aggregation level: Concept Component Variables

At the previous sections we found that the Internet Freedom does indeed have a linear relationship with the Polity2 score and its concept variables and this tendency explains more than 60% of the variation. To see the pattern of the relationship we will continue the analysis at the level of concept component variables (see Figure 7 below).





Due to the fact that the scales of the component concept variables are either ordinal or nominal and have a small number of categories, we performed a cross-tabulation analysis and applied measures of association to see if there is a significant linear relationship between the component concept variables and the Internet Freedom Status (Meier, Brudney, and Bohte 2009). For this level of disaggregation instead of using the scale Internet Freedom variable we used the simplified nominal variable indicating the Internet Freedom Status in three categories: Free, Partly Free and Not Free.

The Table 4 below represents the strength of the relationship between the Internet Freedom Status and the concept component variables representing the three concept components (Executive Recruitment, Executive Constraints, Political Competition and Opposition) and two conceptual dimensions (Contestation and Inclusion).

	Variables	Pearson Chi Square	Cramer's V
Independent variable	Internet Freedom Status		
Executive recruitment	Regulation of Chief Executive Recruitment.	.005	.363
concept component	Competitiveness of Executive Recruitment.	.000	.600
variables	Openness of Executive Recruitment.	.048	.334
Executive Constraints concept component variable	Executive Constraints	-	-
Political Competition and Opposition	Regulation of Participation	.000	.667
concept component variables	Competitiveness of Participation	.000	.710

Table 4. Measures of association: Internet Freedom and Concept component variables.

Pearson Chi Square represents the significance level of the relationship.

Cramer's V represents the strength of the linear relationship: (<0.3) – very weak relationship; (0,3-0,5) some relationship; (0,51-0,7) – strong relationship; (>0.7) – very strong relationship.

We will now discuss the results referring to each concept component variable separately. We will only analyze the statistically significant strong and very strong relationships in more detail. The executive constrains variable will not be included it this level of analysis, since at the most disaggregate concept component variable level it is identical to the concept variable (the same variable is used at both levels of disaggregation).

4.1.3.1 Executive Recruitment

From all the concept component variables of the Executive Recruitment, only Competitiveness of the Executive Recruitment proved to have a strong statistically significant relationship with the Internet Freedom Status (Cramer's V .600).

			Competitiveness of Executive Recruitment			
			Selection	Selection Dual/Transitional		
Internet	Free	Count	0	2	14	
Status		% within Internet Status	0.0%	12.5%	87.5%	
	Partly free	Count	5	10	8	
		% within Internet Status	21.7%	43.5%	34.8%	
	Not free	Count	10	0	1	
		% within Internet Status	90.9%	0.0%	9.1%	
Total		Count	15	12	23	
		% within Internet Status	30.0%	24.0%	46.0%	

Table 5. Crosstabulation of the Internet Status and Competitiveness of Executive Recruitment.

In the crosstabulation table above we can see that more freedom on the internet is actually related to more competitiveness of recruitment. Almost 90% of the countries with free internet status organize election to recruit their executives. Consistently, in over 90% of the countries where the internet is not free, the executives are appointed through non-competitive selection procedure and almost half of the countries where the internet is partly free have mixed procedures for executive recruitment.

4.1.3.2 Political Competition and Opposition

The analysis at the concept variable aggregation level showed that the Internet Freedom index had the highest predictive potential on Political Competition and Opposition concept variable. Consistently with these results, both concept component variables (Regulation of Participation and Competitiveness of Participation) had statistically significant strong relationship with the Internet Freedom Status (see Table 4 above).

4.1.3.2.1 Regulation of Participation

The crosstabulation table below (see Table 6) suggests an interesting pattern of how the Regulation of Participation is related to the Internet Freedom status.

Regulation of P					rticipation	
Multiple Identity Se				Sectarian	Restricted	Regulated
Internet	Free	Count	6	2	0	8
Status		% within Internet Status	37.5%	12.5%	0.0%	50.0%
	Partly free	Count	12	14	2	0
		% within Internet Status	42.9%	50.0%	7.1%	0.0%
	Not free	Count	1	3	9	0
		% within Internet Status	7.7%	23.1%	69.2%	0.0%
Total		Count	19	19	11	8
		% within Internet Status	33.3%	33.3%	19.3%	14.0%

Table 6. Crosstabulation of Internet Status and Regulation of Participation.

Most of the countries with free internet status tend to either have multiple identity of participation meaning that there are some political groups representing interests of ethnic or regional groups and competing for political influence but there are no strict rules, or the participation is highly regulated, meaning that all significant groups and issues are highly represented and there are no particular interest groups that are excluded from the participation in the political processes. Almost half of the countries where the internet is partly free also have multiple identity of political participation regulations. However, another half of theses countries there is a sectarian mode of political participation where multiple identity groups compete for participation and some groups are excluded from access to political participation and positions of power. In the majority of countries where the internet status is not free, the restricted participation mode prevails, meaning that even though organized political participation is allowed, certain groups or issues are excluded from the political processes on the regular basis (Marshall, Gurr, and Jaggers 2014).

4.1.3.2.2 Competitiveness of Participation

The Competitiveness of Participation proved to have the strongest relationship with the Internet Freedom Status variable (Cramer's V .710). The crosstabulation table below (see Table 7) also suggests an interesting pattern: countries with more internet freedom tend to lean towards more competitive participation. In other words, countries with free internet also tend to accommodate various political groups competing for political influence without coercion or disruption. On the other hand, most of the countries where internet is not free also tend to restrict oppositional activities operating outside of the regime; they either entirely repress oppositional competition (Repressed Competitiveness of Participation) or try to exclude substantial oppositional groups operating outside the regime (Suppressed Competitiveness of Participation).

			The Competitiveness of Participation				
			Repressed Supressed Factional Transitional Competitive				
Internet	Free	Count	0	0	2	6	8
Status		% within Internet Status	0.0%	0.0%	12.5%	37.5%	50.0%
	Partly free	Count	0	6	10	11	0
		% within Internet Status	0.0%	22.2%	37.0%	40.7%	0.0%
	Not free	Count	7	4	2	0	0
		% within Internet Status	53.8%	30.8%	15.4%	0.0%	0.0%
Total		Count	7	10	14	17	8
		% within Internet Status	12.5%	17.9%	25.0%	30.4%	14.3%

 Table 7. Crosstabulation of the Internet Status and The competitiveness of Participation.

5 Discussion

More Internet

Our literature review suggests that the internet penetration might have been an appropriate predictor for the level of democracy at the beginning of the internet revolution but as later studies suggest it might have lost its relevance as the internet became a mainstream phenomenon and evolved into a complex social space fostering political processes online. We tested the relationship between the internet penetration (the number of internet users per 100 people) and the level of democracy at different levels of conceptual abstraction to see whether the quantity of internet has lost its potential as a reliable predictor of the level of democracy. Consistently with our hypothesis, at the highest level of conceptual abstraction we did not find any significant relationship between the aggregate Polity2 score and the internet penetration. To gather more evidence for this finding, we continued the analysis at the lower level of abstraction and tested whether the internet penetration had any linear relationship with the democracy concept variables that have been attributed to the two conceptual dimensions, namely, contestation and inclusion. The findings of the further analysis have been consisted with the results at the higher level of abstraction and thus we were able to find a considerable amount of evidence in favor of the hypothesis that the internet penetration is not a reliable predictor for the democracy score.

Our statistical analysis showed a strong trend that the internet penetration level of the previous year could not predict the democracy score of the following year. If we measured the development of the democratization process over an extended period time and monitor the change of the democracy score, the internet penetration might be

a valuable proxy indicator, since some of the studies suggest that the growing number of internet users correlates strongly with the growing levels of democracy (Guillén and Suárez 2005). However, our findings suggest that if we measure democracy in static terms, or in other words if we appoint a score for the level of democracy at a certain point in time without performing a time series analysis, the internet penetration loses its explanatory value entirely.

More Internet Freedom

While the internet penetration did not demonstrate significant potential for predicting the level of democracy, the internet freedom performed very well in predicting the Polity2 score and the values of its concept variables and concept component variables at all the levels of the conceptual abstraction.

At the highest level of aggregation the internet freedom score proved to have a strong positive significant relationship with the Polity2 score. To be more precise, we found that a 1% increase in the internet freedom corresponded with the 1,37% increase in the Polity2 score. While the numbers show that more internet freedom might actually mean a higher level of democracy, an aggregate score gives little information on what exactly does *more democracy* imply. To be able to extract meaning of this statement, we had to go one step down our ladder of conceptual abstraction and see how did the internet freedom indicator interact with the democracy concept variables.

Our analysis at the concept variable level found that the internet freedom was the only independent variable that could explain around 60% of the variation in all three Polity2 concept variables. Our regression models confirmed that if a 1% increase in the internet freedom score corresponds with more than 1% increase in the values of the concept variables. However, taking into account the measurement scales for the

concept variables, a one percentage increase does not have a significant effect on the actual value of the variables since they are all measured on ordinal scales ranging from seven point scale of the Executive Recruitment variable to 10 point scale of the Political competition variable. To make more sense of our results, we calculated the relationship the other way around and asked how much should the internet freedom score change to correspond with the actual change in the values of the concept variables.

Interestingly, it turned out that in order to move the variable of the executive recruitment by one point on its eight point ordinal scale, the internet freedom score should change by almost 11 points (10,75). Similarly, to have any effect on the Executive Constraints, the internet freedom indicator should change by almost 12 points (11,9). The most sensitive concept variable proved to be the Political Competition and Opposition, representing the inclusion component in our conceptual framework; the internet freedom score should change by approximately 8 points (7,518) to have any effect on the value of the Political Competition and Opposition variable. At this level of aggregation we found that even though the internet freedom is strongly related to the concept variables of democracy and they all tend to move together, due to the differences in the scales of measurement the internet freedom score has to change rapidly in order to reflect even minor changes in the concept variables and consequently in the aggregate democracy score. But if we put it the other way around, it seems that the internet freedom score is a more sensitive indicator and it could reflect minor fluctuations in the level of democracy when the conventional indicators fail to do so due to their rough scales of measurement.

At the highest level of conceptual disaggregation we were able to indicate the strength of the relationship between the concept component variables and the internet freedom score. The cross tabulation tables and the measures of association showed that the internet freedom had the strongest relationship with the concept component variables related to the political competition and opposition concept variable that was an attribute of the inclusion dimension. The analysis at this level confirmed that the internet freedom had a positive relation to concept component variables measured in ordinal scales having a small number of categories. Looking particularly at the variables related to the political competition and opposition, the distribution of our observations reflected the tendency that more internet freedom implied more opportunities for citizens to participate in the democratic process and influence the decision making. This finding comes back to the very beginning of this paper where we pointed out that democracy in the most general terms is related to the rule of the people.

Opportunities for Further Research

Our analysis presented a number of interesting findings, however there are still a lot of questions to be explored further in order to untangle the complex relationship between the internet and democracy. To answer the question of how well the internet freedom can predict the level of democracy we analyzed the relationship of the dependent and independent variables with one year lag and with a limited number of observations. In order to confirm the results and indicate more substantial patterns, further analysis could be continued by incorporating more observations, e.g. by performing a time series analysis or pooling the observations from a wider time span.

The validity of the findings could also be further improved by adding more control variables to the regression models. Controlling for the levels of education, urbanization, sociocultural structure, Human Development index and etc., would

enable to check whether the internet freedom can explain the variation in the democracy scores more systematically than other control variables.

In this paper we tested whether the internet freedom can predict the level of democracy, but we did not analyze the causal mechanisms of this relationship. For further research it would be interesting to not only test the forecasting potential of the internet freedom indicator, but also test whether more internet freedom actually leads to more democratic outcomes of the regime. To get a more complex view on the causal relationship it would be necessary to track the changes over time and, as already mentioned above, include the time series analysis.

6 Conclusions

The internet has been developing rapidly during the last decade ant today it has reached the point where the number of internet users is growing faster than the number of people. The internet has become an important medium for mobilization and political advocacy and as recent events in the Middle East demonstrated, it has gained power to trigger social, economic and political changes (Freedom House 2015). The proponents of the power of people in a democratic society see the internet as a way to extend democracy (Best and Wade 2009). The cyber space can eliminate geographical boundaries, provide an instant communication platform and thus reduce the opportunity costs of political participation. The internet creates an opportunity for the participants of the democratic process to make more informed and enlightened decisions (Margolis and Moreno-Riaño 2013). This technology has become so powerful that states, regardless of their political regimes, started looking for ways to manage challenges posed by the new media. The internet today can not only extend the power of people in the democratic process, but also provide an opportunity for governments to adjust the online discussions and control the new social and political cyber space. The internet has widened the conventional space of political participation and thus raised new challenges for and opportunities for the development of the democratic processes.

Democracy has always been a complex phenomenon but since it became entangled with the internet, the new questions of conceptualization and measurement have raised. The data related to the measurement of democracy has been used for a wide array of aspects from describing the current state of affairs to developing early warning mechanisms that could anticipate democratic crises (Munck 2009) but it seems that the conventional measures of democracy might not be sufficient to capture the democratic fluctuations emerging on the internet and triggered by the internet.

While claiming that democracy is an inherently complex concept, in this paper we argued that the internet, and its quality reflected in terms of internet freedom could be a valuable additional proxy indicator for predicting the level of democracy. Our analysis pointed out that while the traditional measures of democracy such as the Polity IV can only capture relatively big changes in the level of democracy due to the limited number of categories in the scales of component indicators, the internet freedom has a potential to predict minor democratic developments or declines before they are reflected by the conventional measures.

These findings are particularly important when we look at the current context of the global internet freedom. The latest Freedom House report pointed out that the internet freedom has been declining for four years in a row and governments around the world have been introducing more restrictive measures starting from blocking and filtering of content and going as far as the imprisonment of users generating the undesirable content (Kelly et al. 2014). The internet has become a crucial medium for civil engagement and political participation and the Internet Freedom index could be used as an early warning mechanism for minor fluctuations in the level of democracy and predict the bigger changes that are likely to follow.

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