Let's all get pessimistic about ill-being: civil society and political organisation mediations

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Abstract

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Unemployment, job vulnerability, and inflation are among the economic events that generate stress and anxiety in the population. People express their anxiety by reporting ill-being. We evaluate the extent to which negative economic events translate into reported ill-being for the European countries between 2005 and 2019. Our objective is to identify countries that produce the lowest level of ill-being at a given level of negative economic events. We utilize a benchmarking technique called data envelopment analysis. While the standard version of this technique has been used to understand well-being, the standard version cannot explain ill-being. Therefore, we are the first to employ the non-standard version of this technique in the well-being literature known as anti-efficiency or pessimistic DEA. We find that Nordic countries tend to perform best in mitigating the influence of negative economic events on ill-being. Additionally, we discover that countries with well-organized public administration are better at containing ill-being.
Keywords: Ill-being, pessimistic frontier, data envelopment analysis, civil society organizations, trust.
JEL Codes: .

1 Introduction

An ever-recurring issue in policy research is the design, implementation and use of early warning systems (EWS). EWS aim at predicting vulnerabilities of economies to armed conflicts, abrupt financial or economic downturns, difficult political and social transitions, and natural disasters (Niheym and Sislin, 2002). They are sound assessment of potential risk. Some examples are Kaminsky et al. (1998) about financial crises, Kelman and Glantz (2014) for environmental degradation and climate change, Tonry (2010) for asteroid impact, or Hegre et al. (2019) for political violence among numerous existing EWS and topics.

EWS mainly consist of, at minimum, a set of indicators and threshold values. One common feature of EWS is that they usually provide a negative view of the state of affairs. For most indicators , if they increase, a negative phenomenon is taking place and if they reach a predefined value a thorny event will arise[1]. A real world example is the macroeconomic imbalance procedure (MIP) scoreboard introduced with the Lisbon Treaty of 2009 (van Gruisen and Huysmans, 2020). The main part of the MIP scoreboard includes 14 in-

[1] An interesting counter-example is The Living Standards Framework Dashboard in New Zealand that mixes indicator of harsh situations as well as positive aspect of life in the country.

dicators and almost all of them describe a negative feature of the economy: level of indebtedness, inflation, unemployment, etc. The accretion of threats increases the probability of economic stress. In this case, potentially, a crisis for the country with a possible contagion to other European economies (Dany-Knedlik et al., 2021).

In parallel, there is a large strand of psychological literature that shows that economic stress (that could be expressed in terms of economic indicator such as those used in the MIP scoreboard) is responsible for a significant increase in mental health issues, anxiety and depression (Viseu et al., 2018). In addition, there are numerous studies that show a negative correlation between stress, anxiety, depression and wellbeing (e.g. Galinha and Pais-Ribeiro (2011)). Thus, we posit the existence of a relationship between *bad inputs* and ill-being. And, there are some countries that are more or less inclined, efficient, in generating ill-being given bad inputs. Data Envelopment Analysis (DEA) introduced by Charnes et al. (1978) is an approach for identifying *best practices*, countries that defines the best practice frontier, countries that are in our case, paradoxically, more prone than others to have a large share of their population to declare ill-being for a given set of bad inputs.

Unfortunately, in our case, what is defined as a best practice is a country that reaches the highest level of ill-being, in terms of welfare it is clearly sub-optimal[2]. Yamada et al. (1994) propose an alternative DEA formulation that indicates the *worst* performers, countries that are generating, in our case, less ill-being given *bad* inputs. This frontier is optimal in terms of welfare. Ironically, this frontier is called the pessimistic frontier (of ill-being). First, we will use this model to assess who are the countries on the pessimistic frontier, and, how far are the other countries from this frontier for a sample of 27 European countries between 2005 and 2019.

In the one hand, our approach fits in the views of Kagan (2014) a theory of ill-being not based on the absence of wellbeing but on the generation of ill-being linked to the accumulation of bad things. On the other hand, we do not investigate the issue of the bipolar/bivariate nature of ill-being and well-being (see Ryff et al. (2006) or Zhao and Tay (2023) for a discussion on this issue). However, we do not build our analysis on the idea that less *good* implies less wellbeing but rather than more *bad* generates more ill-being. We focus

[2]We use on purpose the word welfare and it is not a synonym of wellbeing, it refers to the condition of an entire country or economy.

on ill-being rather than wellbeing because, as Baranowski (2019) explains for welfare, ill-being is the object of concern and indignation for the people. In some countries struggle takes the form, in the best of cases, of protest, parliamentary and political battles. In the worst of cases, it leads to strikes with the reaction of police (a good example is the yellow vests protests in France, Algan et al. (2020)). In addition, Field (2009) voices that Policy-makers tend to be most concerned with the economic significance of ill-being.

Last, using classification trees (see Charbuty and Abdulazeez (2021) for a presentation of the concept), we examine to what extent civil society organisation such as unionisation or engagement in independent non-political associations, political organisation as well as trust in institutions explain the efficiency of countries to reach the pessimistic frontier. Indeed, as explained by Stutzer (2020), basic institutions play a central role in forming public policy designed to raise individuals' wellbeing. Lane (1988) emphasizes the procedural goods of democracy when people feel respected and treated with dignity and perceive some personal control, understanding and public resonance.

The rest of this paper is organised as follows. Section 2 presents the models. Section 3 elaborate on bad inputs that explain the level of bad outputs self reported ill-being and anticipated ill-being. Then, section 4 present anti-efficiency score and the role of the civil society and political organisation to explain countries' performance. The last section concludes.

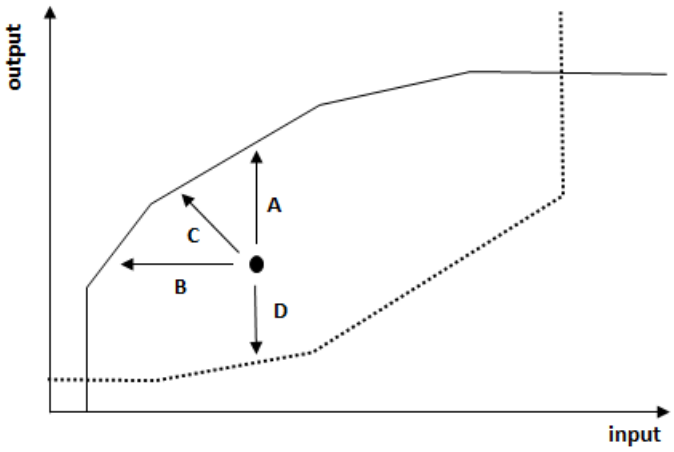
2 Model

Our approach is build on the idea of anti-efficiency, a pessimistic frontier, first proposed by Yamada et al. (1994). In conventional DEA models initiated by the seminal work of Charnes et al. (1978), a set of (good) inputs is related to a set of (desirable) outputs. It is a methodology for measuring the relative efficiency of decision making unit (DMUs) by employing mathematical programming. In traditional DEA, there is a set of DMUs that are producing, for given level of inputs, the maximum technically feasible level of output. These DMUs define a best practice frontier. Then we seek to what extent a country is far from the frontier (see figure 1 plain line). It corresponds to cases A, B and C. In our case, we have *bad* inputs ($x1_{ijt}$) that generate a *bad* output (ill-being, z_{it}). Then the usual DEA framework is not appropriate for our analysis.

Indeed, in case A (known as the output approach), it means that the

country, to reach the frontier, given the level of bad input, seeks to generate more ill-being that is awkward. In case B (the input approach), the country reduces the quantity of bad input but ill-being remains at the same level that is particularly sub-optimal. The case C (the non-oriented case) is even worst, the country diminishes the quantity of bad input but increases ill-being in the population. However, there is another frontier (the dotted line) that is defined by the worst performer, those countries who, given the level of input used, produce the lowest quantity of output. This frontier is known as the anti-efficiency frontier or the pessimistic frontier. The case D indicates to what extent a country might, given the level of input used, lower the amount of ill-being generated. Case D is obviously an optimal strategy for a policy maker.

Figure 1: Frontiers optimistic (plain line) pessimistic (dotted line).



We now present the radial anti-efficiency models. This model minimizes the efficiency of a particular DMU relative to others within the range of no less than one. In the case of one output, we have the following program:

$$\begin{aligned} \min\ \theta_{0t} \ &= \ \frac{u_r Z_{0t}}{\sum_{j=1}^{J} v_j\, x1_{0jt}} \\ s.t.\ &\frac{u_r Z_{it}}{\sum_{j=1}^{J} v_j\, x1_{ijt}} \geq 1, \forall\, i = 1, ..., N \\ & u_r, v_j \ \geq \ 0 \end{aligned} \tag{1}$$

Clearly, the objective is for DMUs the ratio of output divided by the quantity of inputs, it is a productivity / efficiency indicator. The constraints insure

that ratios are over unity for all DMUs. This model can be transformed into a linear one by Charnes-Cooper transformation as follows:

$$\begin{aligned} \min\ \theta_{0t} \ &= \ \mu_r Z_{0t} \\ s.t. \sum_{j=1}^{J} v_j \, x1_{0jt} &= 1 \\ \mu_r Z_{it} - \sum_{j=1}^{J} v_j \, x1_{ijt} &\geq 0, \forall \, i = 1, ..., N \\ \mu_r, v_j \ &\geq \ 0 \end{aligned} \tag{2}$$

Again if $\theta^*_{0t} = 1$ the DMU is on the pessimistic frontier and given the quantities of bad inputs it generates the less ill-being in the country. Any value over unity indicates that the DMU is far from the frontier. Note that this model is not equivalent to maximise wellbeing defined as 100 - ill-being over a set of good inputs measured as some (total input value) - bad inputs. Arguably, this work may be biased toward a weak negative utilitarian view that prescribes eliminating everyone to avoid future suffering rather than choosing an outcome where everyone enjoys an enormous amount of pleasure.

3 Data

3.1 Bad inputs

A difficulty in DEA analysis, and, in particular in our case, is the definition of inputs. These are the *bad things* that could explain the generation of ill-being. In addition, to qualify as inputs it is assumed that countries have some controls over them and could decrease or increase them relatively at will (through policies). There are numerous studies that explain individual traits of people and life events explaining their self-evaluation of life satisfaction (Clark (2018) and Frijters et al. (2020) propose a survey on main key findings from the literature on Life Satisfaction). Personal traits are, for example: age with an inverted-U relationship between age and wellbing (e.g. Cheng et al. (2017)), mixed evidence exists for gender (Clark, 2018) and an ethnicity-gap (e.g. Stevenson and Wolfers (2008)). But, as explained by Clark (2018), these elements are not themselves amenable to policy interventions. Thus, we exclude these variables

from the set of potential inputs.

Regarding life events, work, in particular moving from employment to unemployment explain losses in wellbeing as well as job quality (Clark et al., 2019). Thus, we select variables of unemployment by category: total, male, female and young. And, variables about job vulnerability: total population, male and female. These variables are computed by the International Labour Organisation. They indicate the number of own-account workers and contributing family workers. These workers are less likely to have formal work arrangements, and are therefore more likely to lack decent working conditions, adequate social security and 'voice' through effective representation by trade unions and similar organizations. Vulnerable employment is often characterized by inadequate earnings, low productivity and difficult conditions of work that undermine workers' fundamental rights[3]. clearly policies might play on the level of these variables.

Another determinant of wellbeing/ill-being is inequality. The review conducted by Ngamaba et al. (2018) founds negative, positive and null associations between inequality and subjective wellbeing. For example, the link is positive in Rozer and Kraaykamp (2013). Zagorski et al. (2014) does not find a significant link between the two variable, while for Oishi et al. (2011) the link is negative. To assess inequality we use two indicators of inequality sourced from the World Inequality Database[4]: the market Gini based on income before redistribution and the disposable Gini after redistribution. In our case, we assume a positive link between ill-being and inequality.

Among the possible causes of ill-being we also consider environmental issues. Climate change has emerged in recent years has a global emergency. In a recent survey conducted by the United Nations, over 1.2 millions of persons in 50 countries, 64 percent of respondents see climate change as a major global threat[5]. Thus, many people experience a high degree of worry and anxiety about climate change (Steentjes et al., 2017). Interestingly, these negative emotional responses are observable among people who are directly affected by the ill impacts of climate change, as well as, it can also be trigged by mere thought and perception about climate change among individuals who do not personally suffer from direct impacts (Clayton et al. (2023), Tam et al. (2023)).

[3] https://www.ilo.org/global/about-the-ilo/mission-and-objectives/features/WCMS_120470

[4] https://wid.world/data/

[5] https://www.undp.org/publications/peoples-climate-vote

The University of Notre Dame (UND) proposes indexes to assess the propensity or predisposition of human societies to be negatively impacted by climate change (of Notre Dame, 2023). UND considers six dimensions for possible vulnerabilities: Health, food, ecosystems, habitat, water and infrastructure. We retain only the first fives dimensions, the last one (infrastructure) has little volatility or includes some missings for some European countries. This indicator takes into account the impacts of sea level rise that is not relevant, for example, for Luxembourg and other landlocked countries.

The last dimension is intentional homicides. Researchers have provided clear evidence that the fear of crime can lead to various mental health-related issues including anxiety and psychological distress (Pearson and Breetzke, 2014). In addition, the violent crime rate has a negative impact on some measures of mental well-being for both victims as well as for non-victims (Cornaglia et al., 2014). We have then selected 15 potential bad inputs to explain level of ill-being in 27 European countries[6].

We then face a problem of parsimony. DEA loses its discrimination power in terms of number of technical efficient and inefficient units when the number of DMUs is low compared to the number of inputs and outputs. If one uses too many inputs then all DMUs tend to be efficient and we cannot benchmark countries. A rule of thumbs indicate that the number of DMUs n (countries in our case) should be such that $n \geq 3 \cdot (inputs + outputs) = 3 \cdot (15 + 1) = 48$ (Cooper et al., 2007). We choose to use Principal Component Analysis to reduce the number of variables (see Jolliffe and Cadima (2016) for details about the methodology). New variables are constructed by computing weighted average of original variables given correlations. But, we introduce another issue in the analysis. We need to define inputs, then it should be possible for the policy maker to decrease the value of inputs. And if the principal component increases it should potentially increase the bad output. As a consequence, principal component should be essentially defined by positive correlations with original variables. To do so, we proceed in two steps, first we compute correlations between variables and select the subset of most positively correlated variables. We compute a PCA and a rotation to maximise correlations between this smaller subset of variables. We repeat this step until all variables

[6]Countries included in this study are: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.

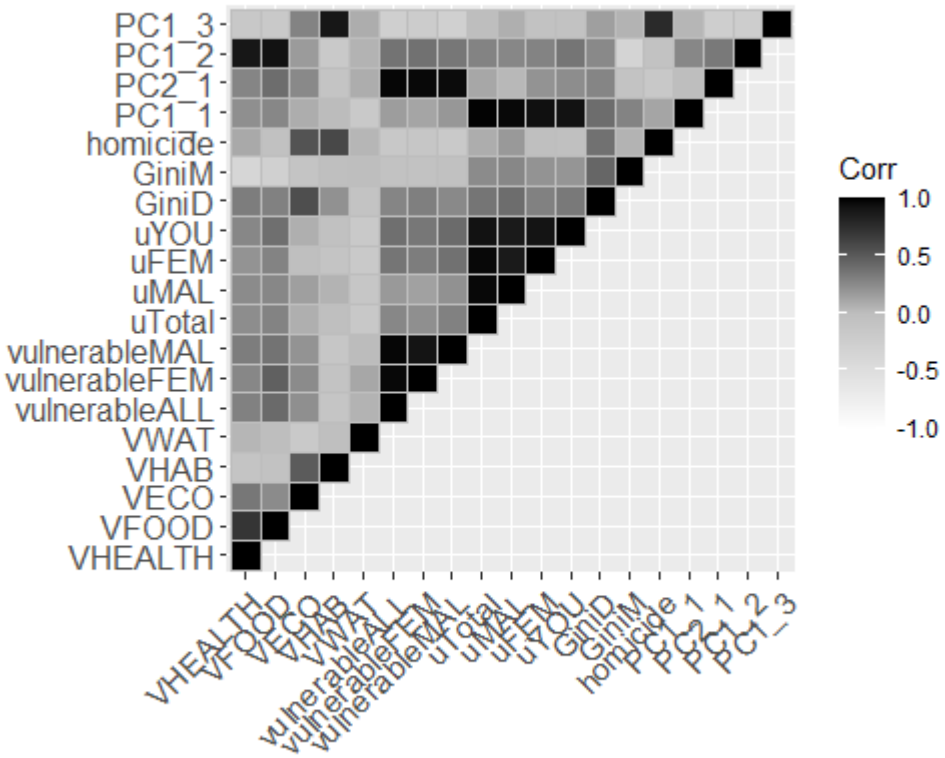
are grouped into different principal components[7]. This insure that all component is positively correlated with original inputs.

3.2 PCA results

The first subset of variables selected concerns employment issues: vulnerable work and unemployment plus the disposable Gini. We keep the two first component that represent about 86 percent of total variance (PC1_1 and PC2_1). The first component is highly correlated to unemployment variables and to a lesser extent to disposable Gini. The second principal component is highly correlated with vulnerable employment. In other words, if the first component increases the level of unemployment increases in the economy, If the second component increases then vulnerable unemployment is more frequent in the economy. Figure 2 pictures the matrix of correlation between components and original variables. another issue with PCA is that principal components can have negative values. Usual DEA models assume positive values for inputs and outputs. It is possible to design specific DEA models dealing with variables that are positive or negative e.g. Pastor and Ruiz (2007). For the sake of simplicity, we rescale variables to have only positive values.

[7]It could be possible to implement non-negative PCA such as in Allen and Maletic-Savatic (2011). A preliminary exploration of this methodology yields comparable results.

Figure 2: Correlation between principal components and original bad inputs.



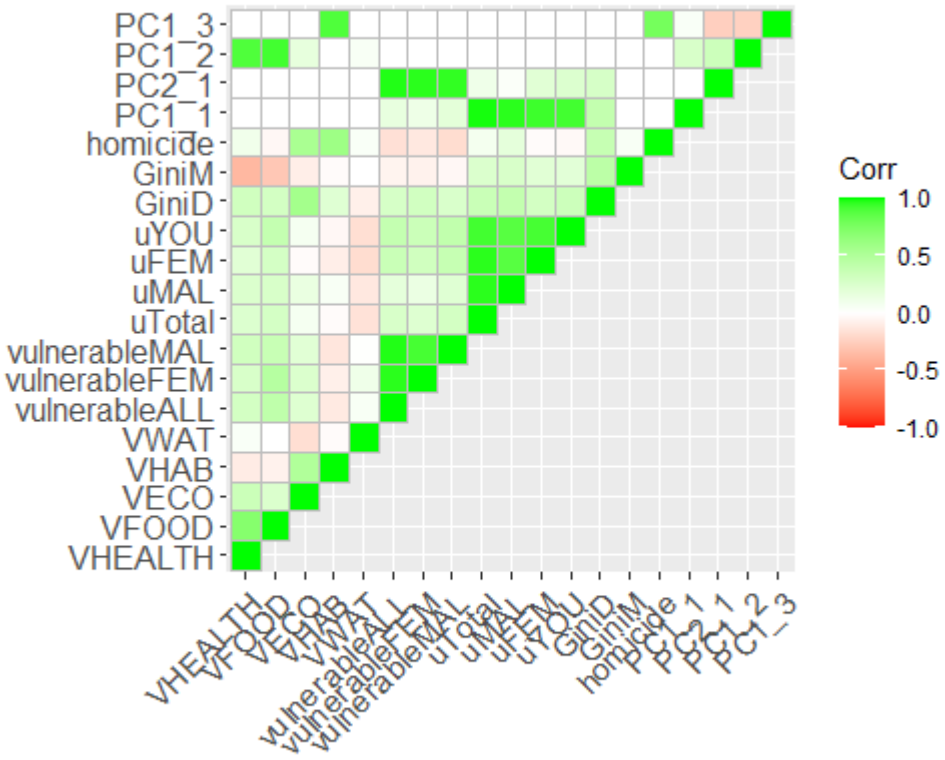
Note: Principal components, subset 1: PC1_1,PC1_1. Subset 2: PC1_2. Subset 3: PC1_3. Orignal vairalbe: Intentional homicide (homicide), market Gini (GiniM), disposable Gini (GiniD), unemployment variable: young, male, female, total (uYOU, uFEM, uMAL, uTotal), vulnerable employment: male, femal, total (vulnerableMAL, vulnerableFEM, vulnerableTOT). Climate change vulnerabilities: Water, habitat, ecosystems, food, health (VWAT, VHAB, VECO, VFOOD, VHEALTH)

The second subset of variables relates to vulnerabilities linked with climate change. And, only three of the indicators are retained to compute one principal component PC1_2 (64% of total variance explained), vulnerabilities about: Health, Food and Ecosystems computed by the University Notre Dame. Food

vulnerability includes six components: projected change of cereal yield due to climate change, population change, food import dependency, rural population, agricultural capacity and child malnutrition. Health vulnerability is based on projected change of deaths from climate change induced diseases, projected change in vector borne disease, dependency on external resource for health service, slum population, medical staff and access to improved sanitation facilities. Last ecosystem vulnerability relates to projected change in biome distribution, in marine biodiversity, natural capital dependency, ecological footprint, protected biomes, and, engagement in international environmental conventions.

The last subset of variables includes in the computation of the last principal components (PC1_3): intentional homicides and vulnerability of habitat. This vulnerability index includes these six dimensions: projected change in ward periods, projected change of flood hazards, urban concentration, age dependency ratio, quality of trade and transport infrastructures, and, paved roads. Two variables from the original set play a minor role and are poorly correlated with principal component variables: market Gini (inequality index before taxes and redistribution) and water vulnerability linked to climate change. The final correlation matrix taking into account zero loading is pictured in figure 3.

Figure 3: Correlation taking into accounts zero loading.



Note: Principal components, subset 1: PC1_1,PC2_1. Subset 2: PC1_2. Subset 3: PC1_3. Orignal variable: Intentional homicide (homicide), market Gini (GiniM), disposable Gini (GiniD), unemployment variable: young, male, female, total (uYOU, uFEM, uMAL, uTotal), vulnerable employment: male, femal, total (vulnerableMAL, vulnerableFEM, vulnerableTOT). Climate change vulnerabilities: Water, habitat, ecosystems, food, health (VWAT, VHAB, VECO, VFOOD, VHEALTH)

Based on average values over the period 2005-2019, the two first dimension of bad inputs (unemployment and vulnerable employment) present some peculiar cases. Romania has low unemployment (score[8] of 0.87) but very high

[8]Scores are unit less variables, they are not any-longer percentages. However, high values

vulnerable employment (score of 4.57) while Spain has very high unemployment (score of 3.79) but very low vulnerable employment (score of 1,15). An extreme situation is Greece (unemployment: 3.38, vulnerable employment: 3.77). The vast majority of countries have relatively low or similar unemployment and vulnerable unemployment such as Austria, Germany, Luxembourg, Sweden and Denmark (see figure 4). There is no specific geographical patterns, Malta is close to Austria but far from Spain, Italy, Portugal. Croatia, Lithuania, Latvia, Slovakia and Bulgaria are close to each other but far from the Czech Republic and Slovenia.

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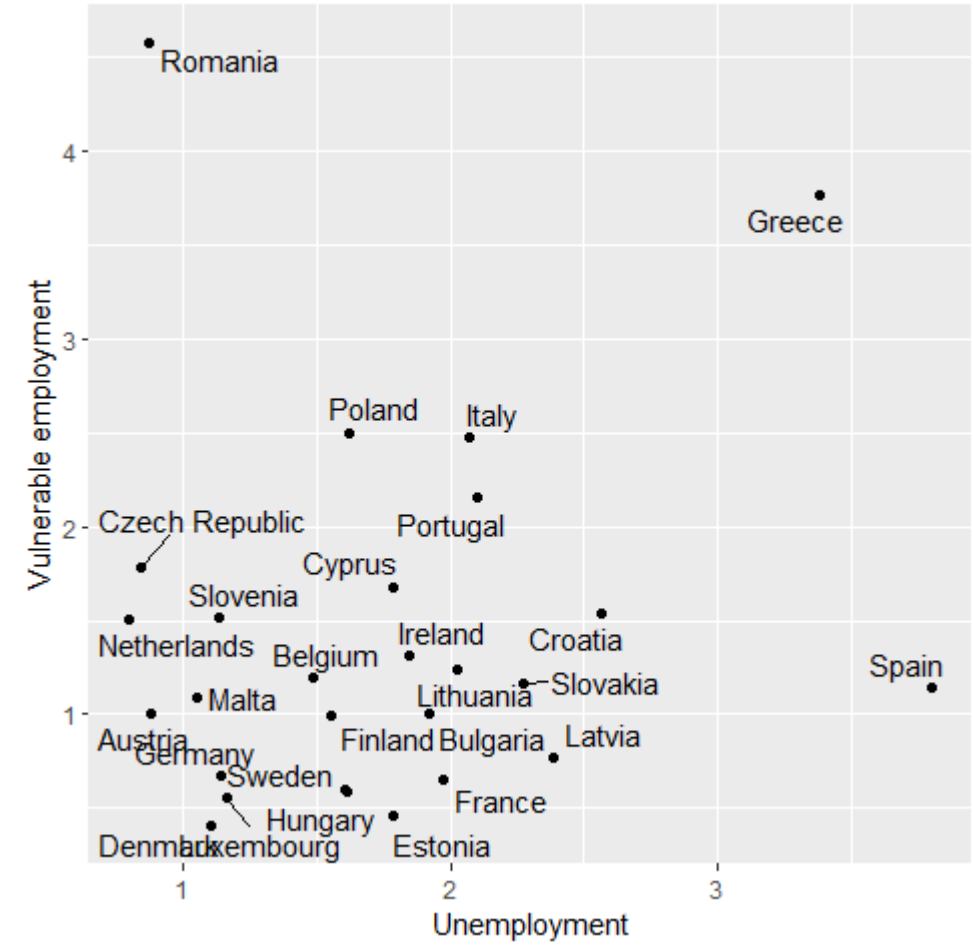
correspond to high percentages for the initial underlying variables.

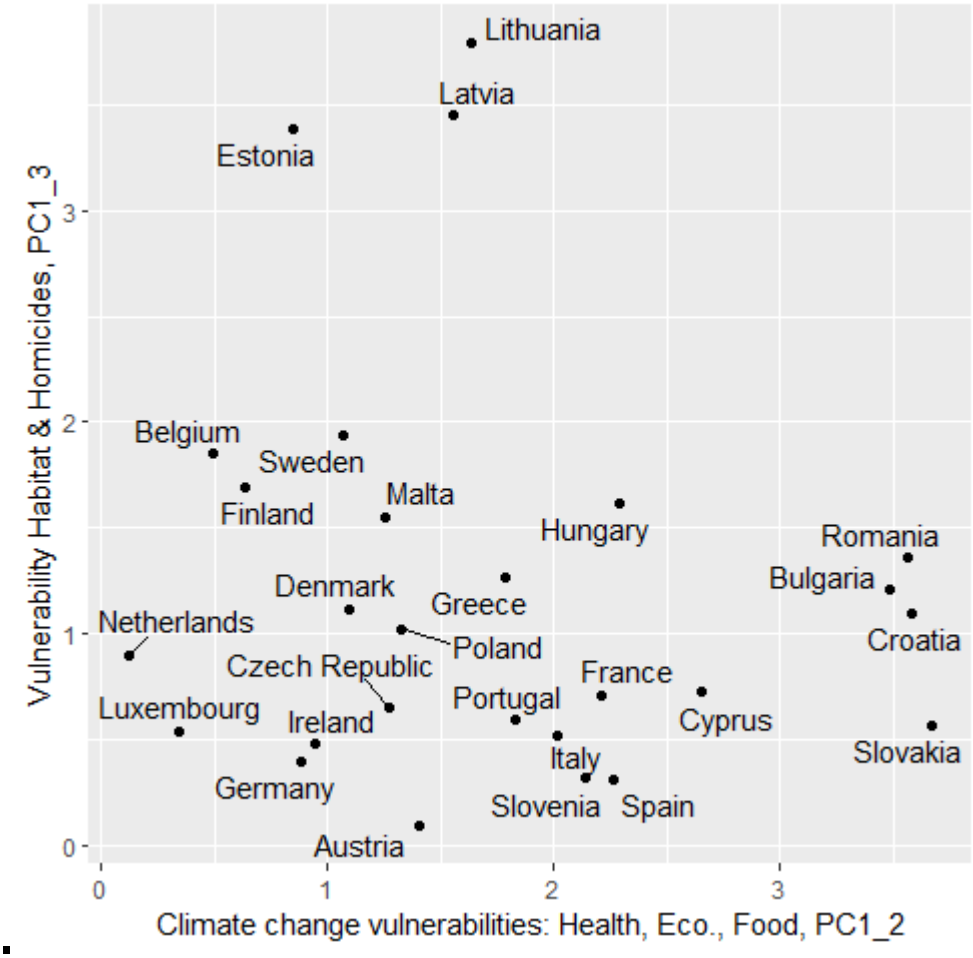
Figure 4: Labour dimension, average 2005-2019.



Note: Author computations.

For the two last dimensions that are mainly defined by vulnerabilities of economies facing climate change. It is interesting to note that the outer observations are only eastern countries: Estonia, Latvia, Lithuania, Hungary, Croatia, Romania, Bulgaria and Slovakia. A specific case is Luxembourg with relatively low values regarding vulnerabilities, see figure 5.

Figure 5: Climate change vulnerabilities, average 2005-2019.



Note: Author computations.

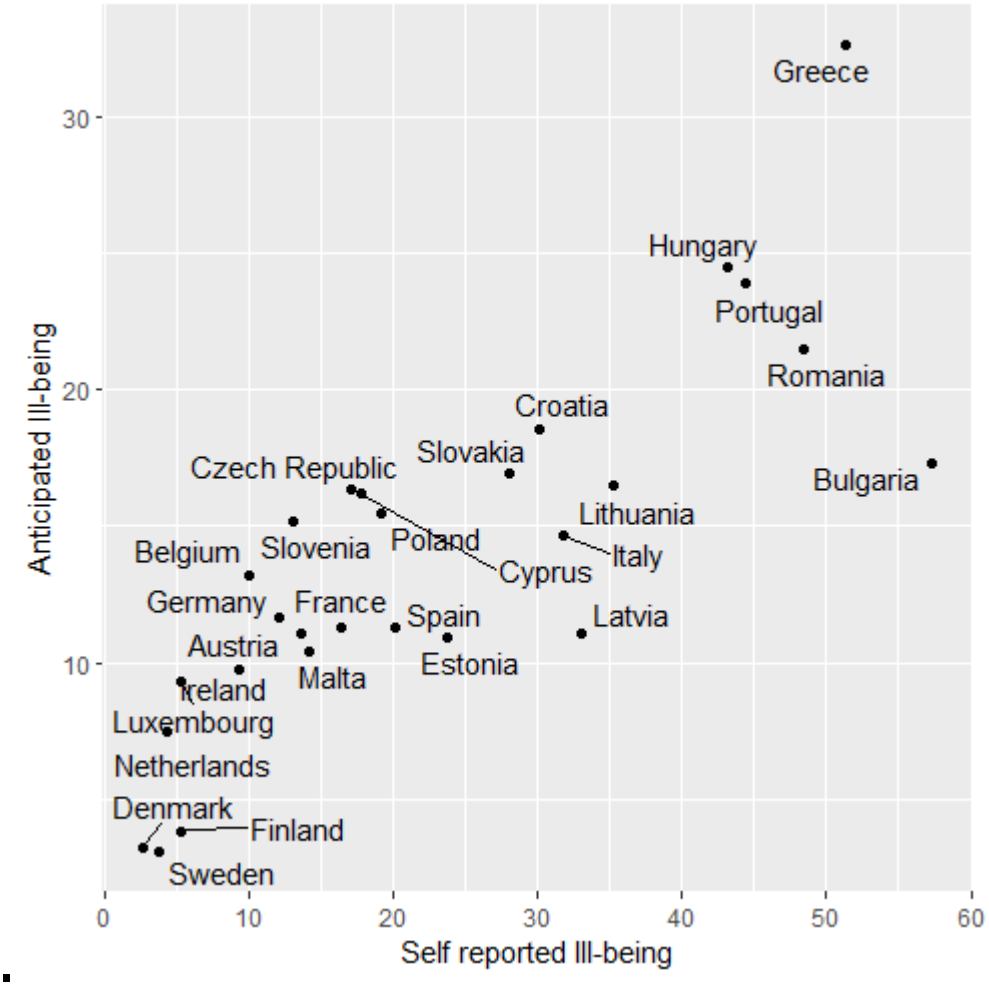
3.3 Bad outputs

Ill-being is sourced from the quarterly Eurobarometer. It corresponds to the yearly average of the sum of the share of people declaring being not at all satisfied with their life and people not very satisfied with their life for the 27 European countries. A second indicator of ill-being is anticipated ill-being that corresponds to the share of people who declare that for the year to come their life will worsen. These data are also sourced from the Eurobarometer. We then examine three models, the first one use self reported ill-being for output, the second model considers anticipated ill-being and the last one introduces

simultaneously both outputs.

Sandvik et al. (1993) indicate, quoting Nisbett and Wilson (1977), that there has always existed considerable skepticism in the social sciences concerning the validity and interpretation of self-reported data in general and in particular for wellbeing measures. We use a single item measure in this study to assess wellbeing. In the case of wellbeing, single-item measures, have been proven to be adequately reliable and valid (Diener et al., 2013) without denying that multi-item measures are more reliable (Schimmack and Oishi, 2005). We therefore assume that this remark holds for ill-being in our case. Thus we favor results from the model including two outputs of ill-being. From figure 6 there is no clear link between geographical area and the share of the population not satisfied with their life. For example, Austria has a share relatively close to the one observed in Malta and Slovenia (respectively 14%, 14% and 13 %). Share can also be strikingly different across countries, Romania has a share of 48% while it is only 4% for Sweden. But, in general, Eastern European countries tend to have a larger share of people dissatisfied with their life. Anticipated and self-reported ill-being are relatively correlated. The link between the two indicators exhibit an S-shape. At low level both indicators are strongly positively correlated, the positive correlation is also present for high level (Bulgaria being an outlier). For intermediate values there is no clear correlation between the two variables.

Figure 6: Self reported and anticipated Ill-being, average 2005-2019.



Note: Author computations.

4 Results

We now look at efficiency scores, the countries that are able to manage efficiently ill-being given bad outputs. Countries that are always on the pessimistic frontier (that are bad in producing ill-being) are Denmark and Netherlands (efficiency score of 1 for each year). Sweden is also on the frontier for most years exception made of 2015 and 2017. Ireland is on the frontier in 2017 and 2018, while Finland is on the frontier only in 2009. The country that is

the farthest from the pessimistic frontier is Hungary (efficiency score of 0.13) followed by Bulgaria (efficiency score of 0.15).

Table 1: Efficiency scores, averages 2005-2019.

	Self reported (M1)		Anticipated (M2)		Both (M3)	
Country	Level	Change	Level	Change	Level	Change
Hungary	0.13	5.17	0.27	10.49	0.27	10.48
Germany	0.28	2.36	0.27	6.28	0.31	4.3
Portugal	0.19	-1.5	0.39	15.18	0.41	10.59
Lithuania	0.21	0.01	0.42	11.35	0.42	11.34
Austria	0.35	4.19	0.38	1.11	0.44	3.54
Czech Republic	0.38	3.63	0.39	10.15	0.47	6.74
Greece	0.27	-3.77	0.44	7.37	0.48	3.78
Estonia	0.27	1.09	0.5	3.53	0.5	2.47
Belgium	0.49	1.71	0.33	2.05	0.51	0.92
France	0.33	0.4	0.5	6.72	0.52	5.08
Croatia	0.32	0.16	0.53	10.75	0.53	9.76
Bulgaria	0.15	4.71	0.54	12.35	0.54	12.35
Luxembourg	0.56	5.77	0.28	11.47	0.56	6.05
Malta	0.44	11.1	0.52	15.9	0.57	12.37
Slovenia	0.54	1.48	0.43	0.57	0.57	1.8
Latvia	0.2	1.79	0.58	8.15	0.58	8.15
Slovakia	0.33	6.96	0.57	8.48	0.58	10.11
Italy	0.29	-2.14	0.59	5.78	0.61	4.08
Poland	0.47	4.05	0.54	2.56	0.64	2.84
Cyprus	0.48	2.23	0.58	12.78	0.65	6.1
Spain	0.45	2.08	0.71	6.08	0.72	5.14
Ireland	0.63	2.02	0.64	1.87	0.72	1.53
Romania	0.35	-1.03	0.74	3.03	0.74	3.1
Finland	0.82	2.67	0.94	1.13	0.97	0.68
Denmark	1	0	0.88	-1.67	1	0
Netherlands	1	0	0.75	12.85	1	0
Sweden	0.97	0.59	1	0	1	0

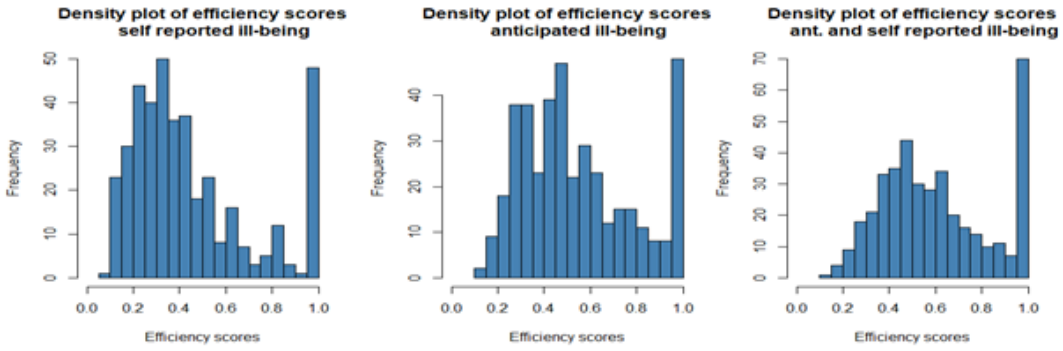
Note: Author's computations.

For the three models the top four countries are always the same. These are three Nordic countries: Finland, Denmark and Sweden. Netherlands is the fourth country (Spain for anticipated ill-being as an output). For the lower part of the distribution, Hungary ranks very low but it seems to a specific case. In general, having a low (high) efficiency score considering self-reported ill-being does not imply a low (high) efficiency score if one looks at anticipated

ill-being. For example, Lithuania ranks very low for self-reported ill-being. Lithuania has a lower score than Belgium for self-reported ill-being (0.22 compared to 0.49) and it is the converse for anticipated ill-being (0.43 compared to 0.34).

Looking at density plots, the distribution of efficiency scores is skewed with a significant amount of observations close to 1 (countries on the ill-being frontier). The remaining efficiency scores are mainly distributed on the left hand side of the distribution. In the case of self reported ill-being a first peak is observed around 0.3-0.35 and a second one around 0.8 (see figure 7). While, for anticipated ill-being, exception made of observation close to one, the distribution is relatively symmetric with a peak around 0.4. Considering both outputs, exception made of observations close to one, the distribution is more symmetric.

Figure 7: Density plots.



We believe that political system and the civil society organization might explain why a country (in terms of efficiency) belongs to a specific part of the distribution. To do so we use classification trees on splits of the density distribution[9]. Rather than applying classification trees each year we pool all years and countries in one set and divide the distribution of all efficiency scores into several groups. There is no rule to decide the number of groups and thresholds values to define groups. We have tested different partition and retained the one with the highest accuracy. Note that different partitions led to comparable results. In general, from one year to another, countries remain in the same part

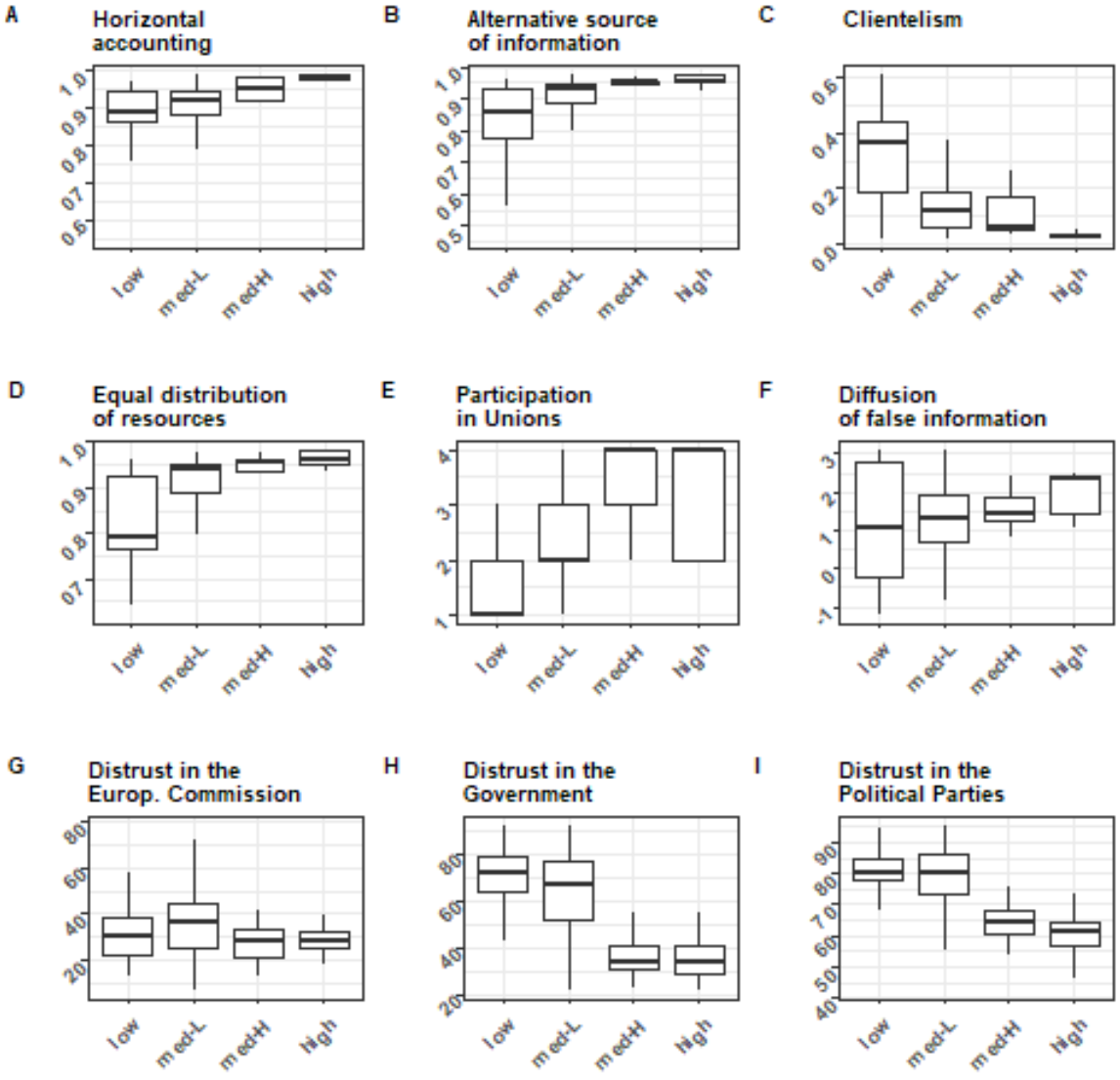
[9]If we were interested in prediction we could have split our sample into training and test sample but we use classification trees as a data selection process to select relevant contextual variables.

of the efficiency distribution. In other words, countries in the lower part of the distribution tend to remain in the left side of the distribution, as well as, for high efficiency countries. Rather than presenting the trees we present box-plots of variables that explain each split. Variables are ordered by importance. The first one (A) correspond to the first split and variable (I) is the least important.

For the case of self reported ill-being, we have divided the set of efficiency scores into four groups: below 0.2 (low efficiency group), between 0.2 and 0.65 (medium low group) between 0.65 and 0.95 (medium high group) and over 0.95 (high efficiency group).

For self reported ill-being (see figure 8), the most important variables is horizontal accountability. Horizontal accountability concerns the power of state institutions to oversee the government by demanding information, questioning officials and punishing improper behavior. This form of accountability ensures checks between institutions and prevents the abuse of power. The key agents in horizontal government accountability are: the legislature; the judiciary; and specific oversight agencies such as ombudsmen, prosecutor and comptroller generals (Coppedge et al., 2023). Deteriorating quality of horizontal accountability institutions is mentioned as symptoms of gradual erosion of democracy (Levitsky and Ziblatt, 2019) that leads to reduced well-being (Dalbert, 2023). For example Denmark has an average score of 0.989 and is in the high efficiency group, while Hungary that is in the low efficiency group as a score of only 0.789. Similarly, countries in the medium high efficiency group tend to have higher horizontal accountability than countries in the medium-low and low efficiency group. For example has a score of 0.979 and is in the medium high efficiency group whereas France has a score of 0.913.

Figure 8: Self reported ill-being variables.



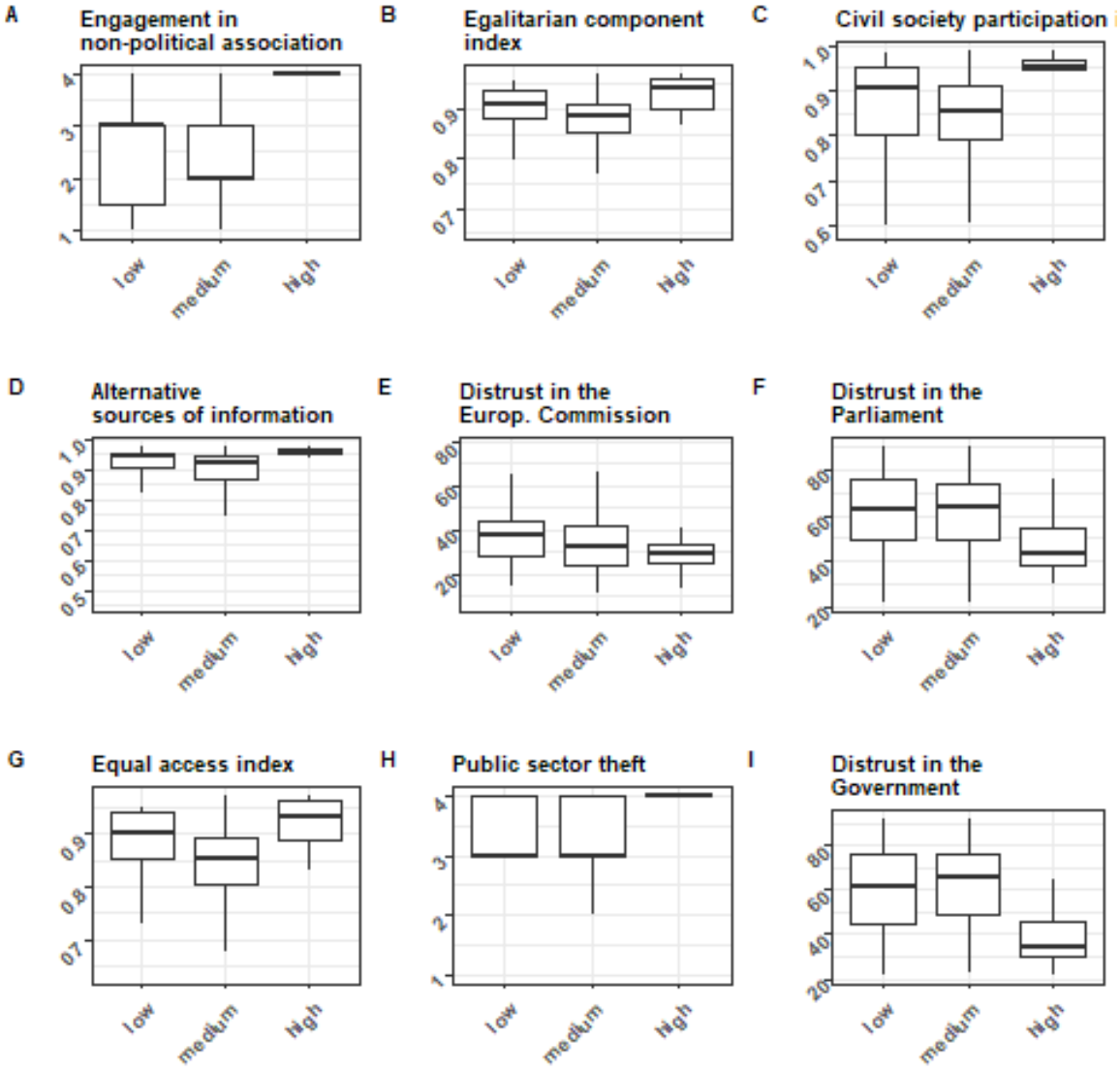
The second variable is the use of alternative sources of information. This variable does not assess the actual use of alternative sources but rather a motivation of using other sources of information such as the internet. To what extent is the media unbiased in their coverage or lack of coverage of the opposition, allowed to be critical of the regime, and representative of a wide array of political perspectives. Again, the higher this index is, the more likely a country will belong to the high efficiency groups. This variable partly reflects

freedom of press. As explained by Alam and Shah (2013), free press bridges government and citizens, promotes political participation and guarantees accountability. Media provide a more real situation of society procure feedback on government policies and help the government revise its policies (Stiglitz et al., 2002). Netherlands who is in the high efficiency group as a score of 0.941 while Bulgaria and hungary who are in low efficiency group have a score of 0.767 and 0.731 respectively. It is very likely that horizontal accountability and alternative source of information reinforce each other. As explained by Riti et al. (2021), free press serves as one of the central supports to establish strong institutions and to increase institutional quality.

Another important variable is clientelism. Clientelistic relationships include the targeted, contingent distribution of resources (goods, services, jobs, money, etc) in exchange for political support. This variables allows to distinguish low, medium and high efficiency countries but does not discriminate medium.low and medium-high countries. Sweden, that is in the high efficiency group as a score of 0.035 while Hungary, in the low efficiency group, has a score of 0.470. While Ireland (medium high efficiency) and Greece (medium low efficiency) have similar scores, respectively 0.169 and 0.170. Clientelism is often associated to bureaucratic inefficiencies and lower successful reforms (Cruz and Keefer, 2015).

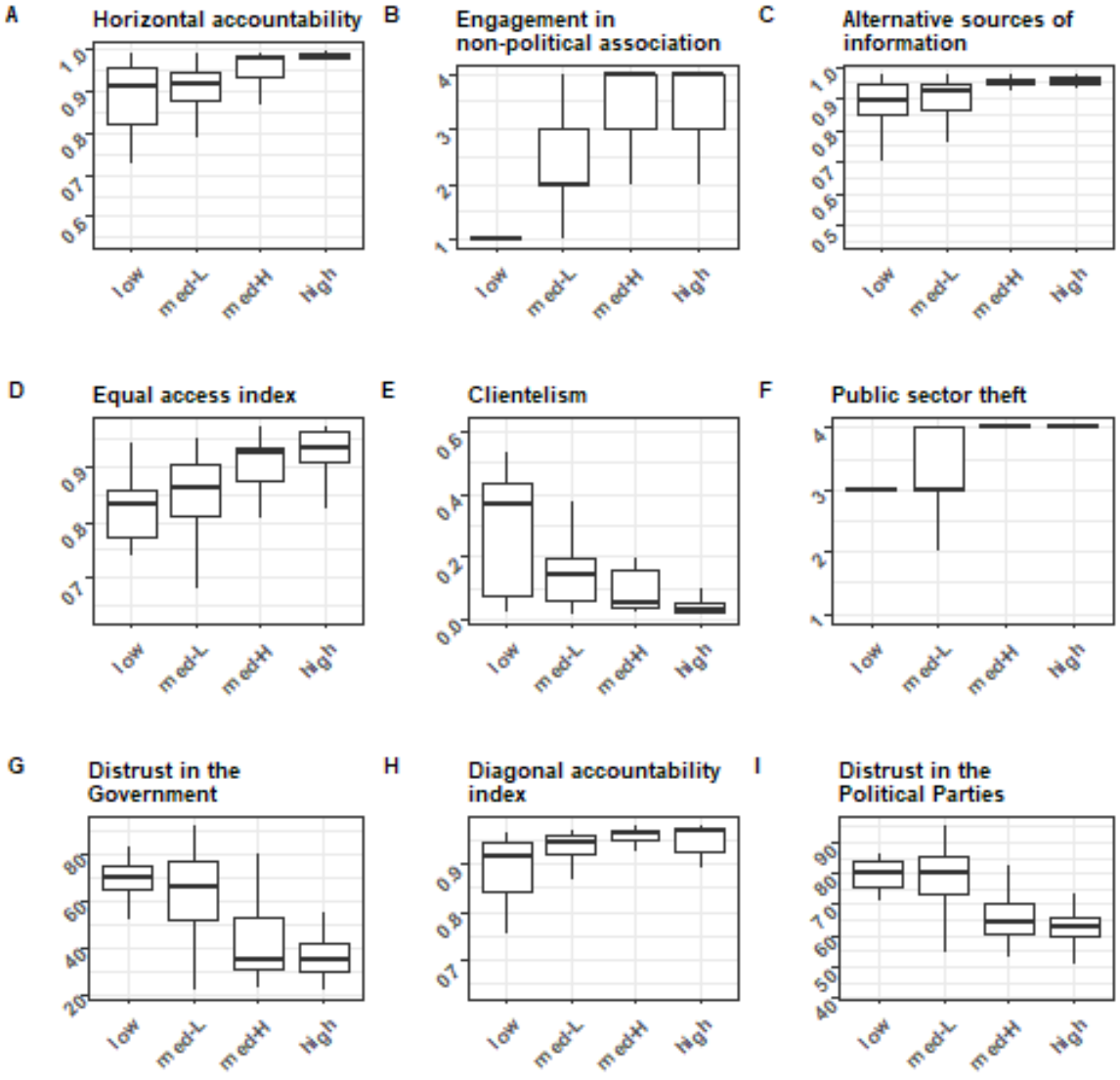
A last variable we would like to elaborate on is equal distribution of resources. This index measures the extent to which resources - both tangible and intangible - are distributed in society. It includes educational equality and health equality, if welfare policies are means tested or universalistic and the allocation of public goods. It is important to note is educational equality means that people have access to the basic education in order to be able to exercise their basic political rights. Basically this index proxy some aspect of inclusiveness of the society. It can be seen as an indicator of equal opportunities and the possibility to voices their dissatisfaction. Providing citizens with more opportunity to voice their concerns will lead to greater satisfaction with the political process Ulbig (2008). Denmark and Netherlands who belong to the top of the distribution have both for scores 0.956 while Hungary has a score of 0.740 and is at the bottom of the distribution of efficiency scores.

Figure 9: Anticipated ill-being variables.



About anticipated ill-being we find that considering only three groups is more accurate than considering four groups. However, the tree analysis uncover variables that more efficiently individualise high efficiency countries compared to others. The low efficiency group is defined as countries whose efficiency is below, the medium efficiency group includes countries with an efficiency between 0.3 and 0.9, the high efficiency scores group countries with an efficiency over 0.9.

Figure 10: Self reported an anticipated ill-being variables.



It is interesting to see that the most important variables in the case of self-reported ill-being mainly concern institutions, ability of people to voice their needs through the exercise of their political rights and freedom of media as alternative source of information. Whereas, for anticipated ill-being it is more the participation to the civil society.

The first variable that mainly help to individualize high efficiency countries

is engagement in independent non-political association (it excludes political parties and unions). These countries are characterized by a large share of the population in non-political association. These association are likely to relate to hobbies, sports and socializing. Leisure activities act as a buffer for stress (Iwasaki et al., 2006). S et al. (2009) provide evidence that people who engage in more hobbies and leisure activities showed lower levels of negative moods and depression, and higher life satisfaction.

The second variable that is useful to discriminate more highly efficient countries is the civil society participation index. It indicates if major civil society organizations (CSOs) are routinely consulted by policymakers; how large is the involvement of people in CSOs; are women prevented from participating; and is legislative candidate nomination within party organization highly decentralized or made through party primaries? CSOs include, in particular, interest groups, labor unions, spiritual organizations if they are engaged in civic or political activities, social movements, professional associations, charities, and other non-governmental organizations. Davis and Zhang (2023) shows that countries with high civil society participation are more democratic. Orviska et al. (2014) indicates that more democratic countries have a larger of population with high life satisfaction.

Another important variable is egalitarian component index. This indicator includes three dimensions: equal protection index, equal access index and equal distribution of resources.

5 Conclusion

Life is paved with bad events that turn into harsh consequences and ill-being. However, some countries deal differently with adversity, they are more or less resilient countries. Using anti-efficiency DEA model and pessimistic frontiers we show that these countries are mainly Nordic countries such as Finland, Sweden and Denmark. But other countries from different geographical zone of Europe also perform well: Ireland, Romania and Spain. We hypothesized that the structure of the society and the political system might explain the results in terms of efficiency. Our two main findings is the role of horizontal accountability and social capital. Horizontal accountability prevents the abuse of power, it is not only vital to set-up these institutions, but, to communicate on their role and actions. It would be interesting to evaluate trust in these institutions by citizens. It is interesting to see that social capital will act as a buffer for stress and impact anticipated ill-being.

This work is still at a preliminary stage, it could be interesting to use several items (outputs) to assess ill-deing rather than using self-reported ill-being. The definition of inputs could be refined to include more dimension such as education and health. It could also be extended by including more countries with different institutions and level of development to see if cultural backgroup might also explain ill-being.

Table 2: VDEM variables (part 1).

Variable name	Variable description
• equality:	
v2x-egal	Egalitarian component index
v2xeg-eqprotec	Equal protection index
v2xeg-eqaccess	Equal access index
v2xeg-eqdr	Equal distribution of resources index
v2peedueq-ord	Educational equality
v2pehealth-ord	Health equality
v2clacjust-ord	Social class equality in respect for civil liberty
v2lgdsadlo-ord	Representation of disadvantaged social groups
v2peasjsoecon-ord	Access to state jobs by socio-economic position
v2peapsecon-ord	Access to public services distributed by socio-economic position
• corruption:	
v2exbribe-ord	Executive bribery and corrupt exchanges
v2exembez-ord	Executive embezzlement and theft
v2excrptps-ord	Public sector corrupt exchanges
v2exthftps-ord	Public sector theft
v2lgcrrpt-ord	Legislature corrupt activities
v2xnp-client	Clientelism Index
v2x-rule	Rule of law index
• accountability:	
v2x-accountability-osp	Accountability index
v2x-veracc-osp	Vertical accountability index
v2x-diagacc-osp	Diagonal accountability index
v2x-horacc-osp	Horizontal accountability index
• social capital:	
v2x-cspart	Civil society participation index
v2catrauni-ord	Engagement in independent trade unions
v2capolit-ord	Engagement in independent political associations
v2canonpol-ord	Engagement in independent non-political associations
v2dlengage-ord	Engaged society
v2csantimv-ord	CSO anti-system movements
• media and information	
v2mecrit-ord	Print/broadcast media critical
v2merange-ord	Print/broadcast media perspectives
v2mebias-ord	Media bias
v2xme-altinf	Alternative sources of information index
v2smpardom	Party dissemination of false information domestic
v2smparab	Party dissemination of false information abroad
v2smonper-ord	Online media perspectives
v2smorgavgact-ord	Average people's use of social media to organize offline action:
v2smorgelitact-ord	Elites' use of social media to organize offline action

Note: VDEM data.

Table 3: VDEM variables (part 2).

Variable name	Variable description
• policy making:	
v2dlreason-ord	Reasoned justification
v2dlcommon-ord	Common good
v2dlcountr-ord	Respect counterarguments
v2dlconslt-ord	Range of consultation
v2dlencmps-ord	Particularistic or public goods
v2dlunivl-ord	Means-tested v. universalistic policy
v2clrspct-ord	Rigorous and impartial public administration
v2cscnsult-ord	CSO consultation
v2cacamps-ord	Political polarization
v2cagenmob-ord	Mass mobilization
v2cacritic-ord	Academics as critics
v2xdd-i-ci	Popular initiative index
v2xdd-i-rf	Popular referendum index
• trust:	
NTrust-gov	Share of people who trust the Government
NTrust-par	Share of people who trust the Parliement
NTrust-pp	Share of people who trust the Political Parties
NTrust-ec	Share of people who trust the European Commission
• other variables	
e-regiongeo	Region (geographic)
v2clstown-ord	State ownership of economy

Note: VDEM data.

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