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Egalitarian Democracy and Environmental Sustainability: An Empirical Analysis

Bachelor's project in Statsvitenskap

Supervisor: Indra de Soysa

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Kunnskap for en bedre verden

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1. Introduction

Does egalitarian democracy facilitate environmental sustainability? The importance of democratic inclusiveness is mentioned prominently in several international statements on environmental protection. One such statement being principle 10 of the Rio declaration on environment and development, stating that environmental issues are best handled with the participation of all concerned citizens. This notion extends to theoretical work done on the topic, highlighting the improved effectiveness of environmental policy made by an equal majority, and the importance of democratic inclusiveness for shaping a culture promoting sustainability (Anderson, Bohmelt, & Ward, 2017; Barr, 2008; Bohmelt, Boker, & Ward, 2016; Ezrow, De Vries, Steenbergen, & Edwards, 2010; Shum, 2009).

Empowerment of environmentally aware citizens is thus essential in achieving legitimate, and by extension, effective environmental policies (Bohmelt et al., 2016). An egalitarian democracy is, by definition, more capable of responding to its electorate's preferences than a "normal" democracy, implying that more people are heard, and a broader range of interest and popular concerns taken into consideration. For inclusiveness to be positive for sustainability, though, the median voter's preferences must align with creating better outcomes. If they do not, a democracy will not necessarily produce pro-environment policy.

Using relevant measures of both sustainability and egalitarian democracy from the World Bank and the Varieties of Democracy (VDEM) datasets, this thesis estimates the relationship between egalitarian democracy, in the form of the egalitarian democracy index, and sustainability, in the form of the adjusted net savings. Additionally, it isolates and estimates the relationship between sustainability and equality of access to health and education, as additional measures of equality. The results clearly show a *negative* correlation between egalitarian democracy and sustainability measures. This does not necessarily imply that democratic inclusiveness is bad for the environment, but rather that people lack demand for environmental protection, as egalitarian democracy does not inherently cause sustainability, but rather empowers people to shape the rules and policy governing their society. Demand for environmental policy thus has to be positive for egalitarian democracies to produce sustainability. The negative correlation between egalitarian democracy and the adjusted net savings rate indicates they do not.

Following the introduction, this thesis elaborates on relevant theory in part 2, before part 3, where data and methods are presented. Part 4 and 5 present and discuss the findings of the model.

2. Theory

This part discusses the theory to be tested. The goal of the thesis is to examine the relationship between egalitarian democracy and sustainability. To answer the question, it first defines sustainability, exploring the concept of weak sustainability in addition to introducing the adjusted net savings rate. The thesis then looks at the concept of egalitarian democracy and outline its three dimensions, crucial to making it both possible and productive, before arguing that egalitarian democracy does not inherently create sustainability but empowers people to voice their demands more effectively. Lastly, it looks at how demand for environmental policy is shaped within an egalitarian democracy.

Defining sustainability and introducing the adjusted net savings rate.

Weak sustainability is the idea that total net investment, in terms of all relevant forms of capital, should be kept above zero, so that the *total* capital stock increase over time. This principle is built on the notion that different forms of capital are substitutable for each other, making any erosion of natural capital sustainable, only if investment in man-made or human capital is big enough to compensate for the loss in natural capital (Cabeza Gutiérrez, 1996, p. 147; Neumayer, 2013, p. 23). The underlying rationale of weak sustainability is thus that current generations should manage the environment in such a way that they can increase their own welfare, technology and skills, without hampering the opportunity of welfare for future generations (United Nations, 1987, p. 37).

A standard measurement of weak sustainability is the adjusted net savings rate (ANS). The ANS was created by the world bank as an alternative to the GDP as a measure of economic development, aiming to quantify the true rate of savings of an economy. The measure is calculated using the net savings rate as a base, adding back investments in human and fixed capital, and subtracting the depletion of natural resources and the cost of atmospheric pollution (World Bank, 2020). The technicalities of the measure is further outlined in the methods section.

Defining egalitarian democracy and its three dimensions.

This thesis follows Sigman and Lindberg (2019) in their definition, and proposed measurement, of egalitarian democracy. They define it as:

A regime that provides de facto protection of rights and freedoms equally across the population, distributes resources in a way that enables meaningful political participation for all citizens and fosters an environment in which all individuals and social groups can influence political and governing processes. (p.595).

This implies that the ability to influence politics should be equally made available for everyone in a democracy regardless of social class, financial means, or ethnic grouping. For this to be achieved, society must be structured in such a way that the possibility to govern, or influence government, is the same regardless of existing inequalities. Less well-off individuals should then, in a meaningful way, be able to compete for influence, and office, against well-off individuals, given the same talent. Thus ensuring that everyone can work within the political framework to shape the rules governing their society (Rawls, 2005, pp. 4-7).

Sigman and Lindberg (2019) propose three dimensions crucial to making egalitarian democracy both possible, and productive; i) equal protection of rights, ii) equal distribution of resources, and iii) equal access to influence (pp. 598-600).

- i) All citizens within a democracy should be granted equal rights, and the *de facto* ability to use them. Even though most democracies have constitutionalised equal rights for all, it is often the case that some groups within society will not be able to fully exercise them. Such shortcomings can be seen throughout history where certain groups, like African Americans in the US, have been discriminated against, despite constitutionalised rights. The state should strive to ensure all voices are protected and equally heard, so that a particular group, or individual's, ability to participate is not threatened by others.
- ii) An egalitarian democracy should ensure equal distribution of public goods, and the availability of vital resources for all. Equal access to resources translates into equal access to political rights, as an impoverished member of society will not be able to participate in democracy on the same basis as everyone else. Differences in social or economic standing can thus easily translate into political inequalities.

- iii) Adequate representation of all is not necessarily guaranteed with the protection of rights and equal a distribution of resources. An equal democracy should ensure that individuals and groups, *in reality*, possess the same capabilities to participate and influence. If all are equally capable of competing for influence, political power should be distributed relatively fairly.

These are ideals a society can strive for, but not something that is realistically achievable. Any democracy will have its inequalities, the extent of these inequalities, however, vary significantly. This dimension is captured in the egalitarian democracy index, further outlined in the methods section.

Boyce and Scruggs; income inequality and environmental outcomes.

Traditionally, when looking at how inequalities may affect environmental outcomes, early scholars mostly looked at inequality in terms of income and power (Boyce, 1994; Magnani, 2000; Scruggs, 1998). Having defined both sustainability and the adjusted net savings rate, the thesis now elaborates on relevant theory exploring *how* inequalities, in general, might affect environmental outcomes.

It can be argued that wealthy groups in an unequal society use their power to shift the costs of degrading activities, of which they are the beneficiaries, onto the poor groups in society, as seen in the theory of Boyce (1994). He analyses environmental degradation in terms of winners and losers, emphasising that degradation occurs for the benefit of some, and the loss of others. He especially looks at *how* the winners are able to impose the costs onto the losers, arguing that unequal distribution of income, and thus power, drives environmental degradation. Using their power, fortunate groups in society strive to maximise their short-term profits on the back of environmentally degrading activities, bolstering their position as powerful. A vicious cycle occurs where the wealthy use their power to expand their wealth, increasing the gap between them and the poor. He does point out, however, that wealth and power are not necessarily connected if there is a sufficient democratic framework ensuring an equal distribution of power, regardless of socioeconomic standing.

His theory provides three additional arguments for the negative impact of inequality on the environment; A) damage to the environment is, in many cases, irreversible. In periods of high concentration of power, environmental resources might sustain damage that cannot be undone in periods of equal distribution. Assuming a society will have periods of both, there will be an aggregate loss of resources. B) a skewed availability of information makes it easy for the

powerful to exploit the powerless. The poor cannot act on their rights to prevent degrading activities if the information on such activity is misrepresented by the powerful. C) being afraid to lose their position of power, the powerful have a short-term perspective of the environment. It is in their interest to maximise their profits in the short term, increasing the production levels of polluting activities, leading to an unsustainable rate of degradation (Boyce, 1994).

Two counterarguments can be found in Scruggs (1998), arguing that the assumptions of Boyce are false. First, he challenges the notion that demand for degradation is rising with income, arguing that environmental protection, in reality, is a superior good, thus *rising* in demand with income. Even if marginal degradation were to stay the same with rising income, the distribution of wealth would be insignificant as the level of degradation would be constant. Assuming demand for a clean environment rises with income, society would, in some cases, actually be *better* off with a skewed distribution of wealth. Secondly, he doubts the notion that democratic institutions always produce better environmental outcomes, arguing that it, in many cases, is voter preference for sustainability that ultimately determines the environmental outcomes of a democracy.

Whereas these theories focus on a narrow definition of inequality; *income* and *power*, this thesis aims to capture a broader sense of the concept. An egalitarian democracy, by definition, strives to reduce differences in the political resources available, including income, but also in vital services, like healthcare and education. Egalitarian democracy also expands on the concept of equality by measuring the distribution of rights, and the ability to utilise them in practice. Additionally, this thesis looks at equality in terms of equal access to healthcare and education to check whether government (elite) following pro-poor policies leads to more sustainability. The thesis will now elaborate on environmental policymaking in general, before looking at how egalitarian democracies and processes, allied with "fair" governance, facilitates environmental outcomes.

Environmental policymaking in an egalitarian democracy

Egalitarian democracies do not inherently create sustainable outcomes, but rather empowers people to influence the rules and policy governing their society. This part of the thesis will explore the idea that it is the median voter's demand for environmental policy that ultimately decides how sustainable a democracy is. Additionally, it argues that environmental policy is more effective if made by an equal majority.

Political inclusiveness has been pointed out as one of many concerns in several important international statements on environmental protection, as seen in the principle 10 of the Rio declaration on environment and development. The principle states that environmental issues are best handled with the participation of all concerned citizens. For this to be realised it sets out three fundamental principles to ensure equality, similar to those of Sigman & Lindberg (2019), being; equal access to information, participation, and justice (UNEP, 2010). These principles are guidelines in creating a foundation for people to access and influence the environmental outcomes of their society. For such access to be positive for the environment, though, there must be demand for sustainability amongst the general public. Having facilitated people to influence their democracy towards sustainability does not necessarily mean they will act upon their privilege. Linking demand to policy, and looking at how demand is formed, is thus key to understanding the environmental sustainability of a democracy.

Theoretical work done linking voter demand to environmental policy outcomes shows that favourable opinion on sustainability among the general population prompts a proportional response in amount, and effectiveness, of policy output (Anderson et al., 2017; Bohmelt et al., 2016; Ezrow et al., 2010; Shum, 2009). This relationship can in part be attributed to the nature of democracy; being that power stems from people voting in regular elections, causing shifts in power in accordance with voter preference. Politicians are easily removed from office if they do not act on public demand, creating an incentive to meet their voter's needs. Political parties thus tend to align their policy platforms in a way that captures the interests of a majority of the electorate, to maximise their votes (Anderson et al., 2017).

If the public demand sustainability, resulting governments will thus introduce environmental policies. However, the same holds true if the median voter does not. The public might value increasing welfare higher than environmental protection. They will certainly always require some level of wealth and a steady accumulation of more, before they concern themselves with protecting the environment (Grossman & Krueger, 1994). Just the same as governments cater to demand for environmental protection; they also have to cater to the demands for higher standards of living, lower unemployment etc. People might not be willing to consume less for the benefit of the environment, as the perceived utility of consumption might outweigh the environmental consequences of such consumption.

A more skewed distribution of access to influence would make it so politicians running for office would have to cater their policy to a smaller portion of society. A situation where few

people decide the environmental outcomes of society would not necessarily be bad for the environment, however, if their demand for environmental policy is higher than that of the median voter (Scruggs, 1998). If the demand for sustainability is indeed rising with income, and the group with access to politics are wealthy, the resulting democracy might produce *more* environmental policy.

Indeed, exclusion of people with perceived intentions of opposing environmental policy might seem like a rational course of action, in a quest to speed up the transition into a more sustainable society (Pretty & Ward, 2001). Policy made by some, forced onto others, is an ineffective approach, however, as it would be perceived as illegitimate, hampering its effectiveness. Excluding people from the policymaking process reduce citizen engagement and participation in both political debate and the implementation of policy. Engagement is crucial in the creation of environmental policy due to the importance of changes in *individual* habits and consumption when dealing with environmental issues, e.g., eating less meat, buying fewer cars, or reusing old clothes. The excluded groups would be less likely to consider making these necessary changes if they were imposed on them, contrary to have been built on consensus, including their input. Allowing people to contribute in the policymaking process alongside their fellow citizens could also induce a sense of community amongst participants, creating ownership to the policy produced. Making it more likely that communities as a whole will make the necessary changes towards environmental sustainability (Michels & De Graaf, 2010)

Policy implementation in democracies is inherently incremental, however. A sudden shift in voter demand might take a whole election cycle to manifest itself in governance, in addition to lag caused by the time needed to introduce, ratify, and implement environmental policy. The process of building momentum for an environmental cause takes time, especially when democracy have to cater to many demands simultaneously. Discussions need to be had, and effective policy suggestions need to be made. There will thus be limitations to how fast policy can be introduced, as democratic institutions can only process a given amount of policy at one point (Anderson et al., 2017). A sudden shift towards pro-environmental demand amongst an electorate might be bottlenecked by the slow nature of democratic change. An increase in demand will, however, add weight to forces pushing for environmental policy.

How is demand for sustainability shaped?

So, what shapes environmental behaviour and demand? Early theories looking at how environmental behaviour is formed, argued that more knowledge of our harmful ways would lead to better attitudes towards the environment, ultimately informing pro-environmental behaviour. This way of thinking has been utilised in numerous campaigns over the years, like the UK governments' 'save it' and 'are you doing your bit?' aiming to spread awareness about the environment to improve environmental sustainability (OECD, 2000). Later studies have shown that this approach is not especially effective in shaping people's behaviour, however, highlighting that there is often a discrepancy between knowledge of our harmful ways, and pro-environment behaviour (Barr, 2008, pp. 191-193; Kollmuss & Agyeman, 2002). A person might be well aware that his actions are bad for the environment, e.g., frequent travel by aeroplane, or buying a new smartphone every year, but still choose act in a way that maximises his utility. Since each individual knows his activity will not make a substantial difference to a national or global outcome, he has an incentive to free-ride on the behavioural changes of others.

Later studies have explored the possible factors shaping peoples environmental attitudes and behaviour (Farrow, Grolleau, & Ibanez, 2017; Grossman & Krueger, 1994; Kollmuss & Agyeman, 2002; Pretty & Ward, 2001). It is outside the scope of this thesis to map out why people behave the way they do, as what shapes behaviour and demand is extremely complex. It will, however, touch upon two important factors crucial in shaping demand for environmental policy; *income* and *social capital*. People need a certain level of income before they concern themselves with the environment. Similarly, more "social capital" is essential in creating pro-environmental behaviour. Naturally, such broad concepts as social capital are likely to be more associated with greater egalitarian and inclusive forms of democracy.

Income

As Scruggs points out, environmental protection can be seen as a superior good. As opposed to normal goods, superior goods make up a larger percentage of consumption as income rises due to higher demand (Begg, Vernasca, Fischer, & Dornbusch, 2014). Before an individual concern themselves with consuming superior goods, they need to have their demand for normal goods fulfilled, e.g., people would not buy Russian caviar if they can barely afford bread. The same principle translates into demand for sustainability, where a person struggling to make ends meet would be unlikely to, for example, spend money on local ecological produce, or buy environmentally sustainable clothing from niche stores. This is reflected in

the environmental Kuznets curve (EKC) theory, arguing the level of income, and not necessarily inequality is the key determinant of sustainability.

The EKC theorises that the relationship between economic development and environmental sustainability is that of an inverted U (Stern, Common, & Barbier, 1996). Economic development requires the usage of exhaustible and renewable resources in harmony with the accumulation of real- and human capital. Initially, as an economy grows, it consumes more of its available resources as input in its increased production. This increase in usage escalates until average income reaches a certain point, before a structural change in *what* and *how* an economy produces, and thus the level of degradation, occurs (Grossman & Krueger, 1994, p. 353). This shift comes as a result of the human ability to create technology more capable of protecting scarce resources, offsetting the adverse effects of continuous growth on the environment, in addition to a shift in demand for environmental sustainability, as a result of an increase in living standards (Grossman & Krueger, 1994, pp. 371-372). The EKC thus champions weak sustainable development, suggesting that an increase in economic activity, followed by a rise in average income is the most effective way to promote sustainability.

Environmental degradation not for the benefit of some, but for the benefit of most can thus be productive if the gains of the degradation are invested in the welfare of current and future generations. When people's income rises, and primary needs are fulfilled, they will be more inclined to demand environmental protection.

Social capital.

Social capital is crucial in shaping people's attitudes toward environmental policy, necessary in creating good policy, and effective implementation (Jones, Sophoulis, Iosifides, Botetzagias, & Evangelinos, 2009; Pretty & Ward, 2001). Social capital is particularly crucial in limiting the rate of free-rider behaviour, as people are more likely to act for the common good if they believe others to act in the same manner (Pretty and Ward, 2001). Making the hard sacrifices of living more environmentally is easier done as a community than as an individual. Social norms guide us on how to behave, as we look to people around us to guide our own behaviour. People usually wish to fit in, avoid social disapproval or seek social esteem, and thus choose to act in a way that is seen as socially desirable (Farrow et al., 2017). If the social cost of free-riding, or not behaving pro-environmentally is high, such behaviour is thus made more unlikely (Kollmuss & Agyeman, 2002; Pretty & Ward, 2001). Alongside the importance of social norms in facilitating sustainability, it is also crucial to create some level of trust in the institutions creating environmental policy, as policy is made more effective if

the government implementing it is seen as legitimate, and its actors well respected (Jones et al., 2009).

Egalitarian democracy is a good tool in creating the trust necessary in creating and implementing pro-environmental policy. This is especially true in regard to making the institutions and the policy they produce seem legitimate. The more people and perspectives involved in the policymaking process, the more legitimate the resulting policy will be, making its implementation more effective.

Summary

Demand for environmental policy ultimately informs policy production within a democracy. A more egalitarian democracy is better suited to engage a wider, and more engaged debate on environment, crucial in forming people's attitudes towards sustainability. Egalitarian democracy is thus a better facilitator of people's demands. As people feel more included, they will likely adhere to collective wishes, such as lower pollution. Thus, the first and second hypotheses are:

H₁: Egalitarian democracies have higher levels of weak sustainability.

H₂: Equal governance, measured as greater equality of access to health and education, regardless of the level of democracy, increase weak sustainability.

3. Data and Methods

This thesis aims to examine the relationship between environmental degradation and inequality in access to politics, making use of the World Bank's data on environmental sustainability. This section will elaborate on the variables used and why they are adequate for measuring equality and environmental outcomes. It then outlines the method used in exploring the hypothesis.

The model includes relevant indicators of both sustainability and egalitarian democracy, in the form of the adjusted net saving rate, and the egalitarian democracy index. It also looks at the isolated effects of equality of access to health and education, which are part of the egalitarian democracy measure, as additional measures of equality (World Bank, 2020; Varieties of democracies, 2020). The primary dependent variable is the adjusted net savings rate. The three independent variables are; i) The egalitarian democracy index, ii) Equality of access to health, and iii) Equality of access to education. Previous studies generally use income as the

measure of equality, in the form of the GINI index. This approach does not capture direct governance input, however, which equality of access to health or education do.

Dependant

Adjusted net savings rate (% of GNI)

The dependant variable is the world banks adjusted net savings rate, capturing the *weak* sustainability of a country. The ANS measures sustainability in terms of changes in the capital stock of an economy, not punishing growth itself, but instead looking at how growth is achieved, and resources invested towards future wellbeing. A country with a highly positive ANS might pollute more in terms of absolute CO₂ per capita than other countries, but use its economic gain to create better outcomes for its current inhabitants, so that future generations also have access to resources and opportunities to better themselves. A basic equation for calculating the adjusted net savings rate, as depicted by de Soysa & Neumayer (2005) is:

$$ANS = \frac{\begin{aligned} & \textit{Investement in manufactured capital} \\ & - \textit{Net foreign borrowing} \\ & + \textit{Net official transfers} \\ & - \textit{Depreciation of manufactured capital} \\ & + \textit{Current education expenditures} \\ & - \textit{Net depreciation of natural capital and cost of atmosferic pollution} \end{aligned}}{\textit{Gross national income (GNI)}}$$

The ANS thus consists of a standard measurement of net savings, with adjustments to make it better suited to measure sustainability. The current education expenditures, normally accounted for as consumption, are added to the net savings, whereas depletion of natural resources and an approximated cost of pollution are deducted (World Bank, 2020).

Adjusted net savings: carbon dioxide damage (% of GNI).

In addition to the adjusted net savings rate as a measure of environmental sustainability, the model includes an absolute measurement of atmospheric pollution in the form of an estimated cost of carbon dioxide damage as a percentage of GNI. This measure estimates the cost of damage due to fossil fuel use and the manufacture of cement, where each tonne of CO₂ pollution is assumed to cause US\$30 in damage.

Independent

The egalitarian democracy index

The measurement of the nature of democracy is the egalitarian democracy index proposed by Sigman and Lindeberg (2019). They base their index on ten indicators of democracy from the varieties of democracies (V-dem) dataset to construct measurements of their three proposed

subcomponents of an egalitarian democracy. These subcomponents are then added to the V-dem indicator of electoral democracy, forming the egalitarian democracy index. Table.1 showcases the indicators used for each of subcomponent, and the rationale behind them:

Table 1: Subcomponents, their V-dem indicators, and the rationale behind them

| <i>Subcomponent and their V-dem indicators</i> | <i>Rationale</i> |
|---|--|
| <p><i>Equal protection of rights and freedoms:</i></p> <ol style="list-style-type: none"> 1. Social class equality in respect for civil liberties. 2. Social group equality in respect for civil liberties. 3. Weaker civil liberties population (reversed). | <p>The first two indicators aim to measure the extent of which rights and freedoms are protected across socioeconomic class, and social groupings. The third measures the degree rights and freedoms are equally spread throughout the population.</p> |
| <p><i>Equal distribution of resources:</i></p> <ol style="list-style-type: none"> 4. Particularistic or public goods. 5. Universal welfare. 6. Education equality. 7. Health equality. | <p>The following four indicators aim to measure the extent to which essential resources are equally distributed amongst a population. The first looks at the degree government programs are targeted or pluralistic. The second measure whether welfare is available for all. The following two looks at the distribution of health and education resources.</p> |
| <p><i>Equal access to power:</i></p> <ol style="list-style-type: none"> 8. Power distributed by socioeconomic position. 9. Power distributed by social groups. 10. Power distributed by gender. | <p>The final three indicators measure the distribution of power within a country across socioeconomic position, social group, and gender.</p> |

The aggregate mean of the three subcomponents is then added to the V-dem electoral democracy index to form the egalitarian democracy index. In essence, the more egalitarian a democracy, the more socially inclusive the policymaking is due to the greater access to power and resources for all groups in a society. This approach rewards countries for scoring high in one of the subcomponents, without necessarily punishing them for scoring low in the others. Embodying the egalitarian principles of one subcomponent is always better than scoring low in all components. The isolation and addition of the V-dem electoral democracy index is due to the importance of participation in elections, as this activity is the most fundamental way people can influence their democracy.

Health and education

In addition to using the egalitarian democracy index to estimate the effect of equality on weak sustainability, this thesis isolate and include the V-dem measurements on equality of access to education and health separately. The intuition for measuring access to healthcare and education separately, is that these indicators are good measurements of whether the government (elite) follow pro-poor policies, regardless of regime type or level of democracy. It also aims to highlight the importance of having fulfilled the demand for these basic resources before people start demanding environmental policy.

Controls

Taking care not to include too many independent variables, letting the effects of egalitarian democracy on the adjusted net savings rate to "speak", the model controls for GDP per capita, population size, percentage of population living in cities, and the percentage of GDP attained from natural resources.

Countries with a higher level GDP per capita tend to have a higher savings rate in general as the marginal propensity to save rises with income (Hess, 2010). Increased consumption aspirations can, however, negate this effect after a certain level of wealth, causing a non-linear relationship. The variable is logged to account for skewness in gdppc. Growth in income per capita will often covary with other determinants of the adjusted net savings rate, like the percentage population living in urban environments. The model controls for this variable as people living in cities tend to pollute more (Poumanyong & Kaneko, 2010). Although 50 per cent of the world population live in cities, they produce around 70 per cent of the world's emissions (IEA, 2008). Like with the GDP per capita, the variable is logged to account for skewness. It also accounts for the number of inhabitants in a country, logged to account for skewness.

Similarly, the model controls for GDP tied to natural resources. Evidence suggests there is a negative correlation between the adjusted net savings rate and the amount of the economy tied to the usage of natural resources. Countries highly dependent on natural resources often suffer from the resource curse. Lack of sufficient institutions and low investment in human capital are some of the culprits behind the curse. As they struggle with low investment in human capital and future consumption, resource-driven economies thus tend to have a low adjusted saving rates (Dietz, Neumayer, & De Soysa, 2007). Each of these controls is related to the main variable of interest, egalitarian democracy, and directly affect the ANS.

OLS- regression

This thesis uses Ordinary Least Squares regression (OLS), on a pooled time-series cross-sectional dataset, to examine the effect of inequality on the environment. With this type of data, it is important to control for autocorrelation and heteroskedasticity to ensure that the results of the regression are unbiased. Serial correlation in linear panel-data has a tendency to positively bias the results of a regression as the data correlates to a lagged version of itself (Drukker, 2003; Hoechle, 2007). The Wooldridge test is performed to check whether the dataset contains autocorrelation, *rejecting* the null-hypothesis of no first-order autocorrelation in the data. This is accounted for using the Driscoll-Kraay standard errors proposed by Hoechle (2007), estimating fixed effects, in addition to using Driscoll and Kraay standard errors, robust to cross-sectional dependence (Driscoll & Kraay, 1998).

A Hausman test is performed to check whether to use a fixed-effect model or a random-effect model. The test suggests that there is little difference in the coefficients between the random and fixed effects; thus, the thesis continues using random-effects models for maximising the potential of estimating all forms of relevant variance, both between the cross-sectional and within units.

4. Results

This part of the thesis presents the findings and discusses their implications. It will first interpret the effects of egalitarian democracy on sustainability, after which it looks at the effects of equality of access to health and education. Table 2 presents the first model, estimating the relationship between egalitarian democracy and sustainability in terms of the adjusted net savings rate, estimated cost of CO₂ damage as a percentage of the GNI, and CO₂ per capita:

Table 2: Effect of egalitarian democracy on measures of sustainability

| VARIABLES | (1) ANS | (2) CO ₂ damgni | (3) CO ₂ mtpc |
|-----------------------|---------------------|-------------------------------|-----------------------------|
| egalitarian democracy | -10.51** (3.431) | 0.660** (0.178) | 1.421** (0.467) |
| log. population | 1.334* (0.654) | 0.236** (0.0474) | -0.820* (0.423) |
| log. urban population | -4.764** (1.654) | 0.561** (0.119) | 0.988** (0.262) |
| log. gdppc | 6.414** (0.936) | -0.401** (0.0757) | 1.803** (0.0462) |
| natural resource gdp | -0.0364 (0.0451) | 0.00178 (0.00873) | 0.0181** (0.00620) |
| Observations | 3,434 | 6,448 | 6,112 |
| Number of groups | 154 | 170 | 171 |

Standard errors in parentheses
** p<0.01, * p<0.05, * p<0.10

Column 1 shows a significant relationship between a higher level of egalitarian democracy and lower adjusted net savings rates, the main measure of economic sustainability. The egalitarian democracy index takes a value between 0 and 1. A one-unit increase in egalitarian democracy, reduces sustainability by 10.51 units (%) of GNI. We thus see a *negative* effect on the balance between current and future welfare when all people are equally empowered to influence their democracy. Substantively, holding all other control variables at their mean values, increasing the level of egalitarian democracy by one standard deviation, reduces the adjusted net savings rate by 18,2% of a standard deviation of adjusted net savings. Similar results can be seen when looking at columns 2 and 3 where a perfectly egalitarian democracy coincides with more CO₂ damage as a percentage of GNI, and higher levels of CO₂ pollution per capita.

When looking at the effect of the logged GDP per capita, we see a significant and *positive* effect on the adjusted net savings rate. The loggdppc takes on a value between 4 and 12, with the mean being at 8, where a one-unit increase in the loggdppc increases sustainability 6.4 units (%) of GNI. Holding all other control variables at their mean, a standard deviation increase in income per capita increases the adjusted net savings rate by 69.6% of a standard deviation, making the effect quite substantial in a real-world sense. Similarly, a higher level of income has a negative effect on the percentage cost of carbon dioxide damage in terms of GNI. It does, however, coincide with a higher amount of metric tonnes of CO₂ per capita, suggesting countries with a higher level of average income tend to pollute more in absolute terms, but make up for the damage by investing more in future welfare and physical capital.

The percentage of the population living in cities has a significant, and quite large, effect on the adjusted saving rate, with an increase in urban population by one standard deviation causing a fall in the adjusted net savings rate of equal to 24,5% of a standard deviation. It also affects the CO₂ damage as a percentage of GNI, and on average, increases the metric tonnes of CO₂ produced per capita. The amount of GDP tied to natural resources has a negative but insignificant effect on the ANS and CO₂ damage as a percentage of GNI. It does, however, have a significant and positive effect on metric tonnes of CO₂ per capita, which are results quite consistent with economic activity and atmospheric pollution. The size of the population has a positive effect on the ANS and, subsequently, a negative effect on particle emissions damage and CO₂ per capita.

Equality of access to health and education

Table 3 and 4 present the effect of equality of access to healthcare and education on the adjusted measures of sustainability:

Table 3: Effect of equality of access to healthcare on measures of sustainability

| VARIABLES | (1) ANS | (2) CO ₂ damgni | (3) CO ₂ mtpc |
|-----------------------|---------------------|-------------------------------|-----------------------------|
| access to healthcare | 0.0154 (0.427) | 0.152** (0.0356) | 0.382** (0.0984) |
| log. popopulation | 1.430* (0.682) | 0.246** (0.0508) | -0.857* (0.425) |
| log. urban population | -5.550** (1.583) | 0.546** (0.113) | 0.955** (0.286) |
| log. gdppc | 5.823** (1.005) | -0.429** (0.0823) | 1.714** (0.0634) |
| natural resource gdp | -0.0169 (0.0484) | 0.00286 (0.00872) | 0.0210** (0.00597) |
| Observations | 3,434 | 6,462 | 6,126 |
| Number of groups | 154 | 170 | 171 |

Standard errors in parentheses

** p<0.01, * p<0.05, * p<0.10

Table 4: Effect of equality of access to education on measures of sustainability

| VARIABLES | (1) ANS | (2) CO ₂ damgni | (3) CO ₂ mtpc |
|-----------------------|---------------------|-------------------------------|-----------------------------|
| access to education | -0.780 (0.482) | 0.249** (0.0373) | 0.291** (0.0739) |
| log. population | 1.367* (0.678) | 0.250** (0.0473) | -0.875* (0.422) |
| log. urban population | -5.193** (1.568) | 0.468** (0.102) | 0.912** (0.286) |
| log. gdppc | 6.085** (0.957) | -0.427** (0.0828) | 1.775** (0.0492) |
| natural resource gdp | -0.0243 (0.0468) | 0.00276 (0.00855) | 0.0185** (0.00616) |
| Observations | 3,434 | 6,462 | 6,126 |
| Number of groups | 154 | 170 | 171 |

Standard errors in parentheses

** p<0.01, * p<0.05, * p<0.10

There is no significant relationship between either equality of access to healthcare, or equality of access to education, and the ANS. They do, however, have a significant and *positive* effect on CO₂ damage and the amount of CO₂ per capita. Both indicators take a value between -4 and 4. This implies that a low level of equality, in either metric, leads to *less* CO₂ damage as a percentage of GNI, and CO₂ per capita. Substantively, a standard deviation increase in equality of healthcare and education amounts to 15% and 24% of a standard deviation in CO₂

damage and an 8% and 5% of a standard deviation in CO₂ per capita, respectively. This indicates that equality of access to healthcare and education is not necessarily a prerequisite for sustainability; in fact, societies in which these political features exist also tend to pollute more. This might, however, be a bi-product of the more advanced nature of these societies, and not necessarily equality of access to education and health *per se*. Notice, however, income levels and urbanisation is controlled for, both of which capture aspects of advanced economies.

To summarise; we see a significant *negative* effect of egalitarian democracy on the ANS of a more egalitarian democracy, but a similarly *positive* effect on the ANS from the growth of income. This result reflects itself in the positive effect on both the CO₂ damage as a percentage of GNI and the amount of CO₂ per capita. Equality of access to health and education both have small but significant impacts on both the percentage particulate damage and the metric tonnes of CO₂ per capita. There seems to be no support for the view that greater egalitarianism increases sustainability and reduces atmospheric pollution.

5. Discussion

The hypothesis tested in this thesis was that a higher level of egalitarian governance measured by an indicator of inclusive democracy would lead to more sustainability in terms of a higher adjusted net savings rate. The results from the analysis clearly show there is a clear and significant *negative* correlation between the level of egalitarian democracy and the adjusted net savings rate. This thesis argues this is a result of people's lack of demand for sustainability, as an egalitarian democracy does not inherently create sustainability, but empowers the people to channel their interests more effectively. The demand for sustainability within an egalitarian democracy thus has to be positive for environmental outcomes to be better. The negative effect of equality, as seen in table 1, suggests that people do not necessarily demand environmental protection. In fact, it might suggest that people value fulfilling their wants and needs higher than creating better outcomes for future generations. This interpretation seems quite intuitive, both because environmental problems are hard to grasp, where the action of polluting more, e.g., buying a new smartphone every year, is far removed from any notion of harming the environment, and that even with some knowledge of our harmful ways, we might still choose to act in a way that maximises our utility.

As seen in some parts of the world, though, societies in which people are above a certain living standard start caring for the environment. This reflects itself in the positive effect of income on the ANS, suggesting that above a certain level of welfare, people start concerning themselves with the environment. This is in line with the EKC, theorising that people start living more sustainably after a certain level of income is achieved, after which society as a whole becomes more sustainable due to a shift in demand. Egalitarian democracy might facilitate the necessary growth in income amongst the median citizen and will work as a tool for sustainability when the people in it start demanding protection.

Egalitarian democracy might also facilitate the creation of social capital, crucial for a positive shift towards sustainability. Demand for environmental protection is something that has to be built socially, both in transferring the knowledge required to understand our impact on our environment to new generations, and building a collective culture of environmentalism within the current generations. Making the necessary change on both an individual, and societal, level is made easier if people believe they are doing it in solidarity with everyone else.

When people reach an appropriate level of welfare, and a collective culture for sustainability is created, egalitarian democracy will be a facilitator of people's demand for sustainability. Such a shift might be achieved faster if enforced onto the majority by a political elite, but this is unlikely to be a good long term solution as many aspects of sustainability relies on individual action, e.g., eating less meat, or driving less. Policy is more effective if seen as legitimate by the majority and built upon the collective culture for sustainability. If these prerequisites are not in place, the policy is likely to be ineffective.

Equality of health and education seems to not be prerequisites for sustainability, and as evidenced by the analysis, actually correlates with an increase in the CO₂ per capita and CO₂ damage as a percentage of the GNI. The notion that equality of access to these essential services inherently causes more pollution by themselves is theoretically unlikely, though. It seems more plausible that the negative effect is a bi-product of the more advanced nature of the societies where equal access to these resources exist, and not necessarily equality of access to education and health *per se*.

To conclude; there is much of theoretical support for the notion that egalitarian democracy facilitates sustainability. However, this relationship seems hard to substantiate in terms of the adjusted net savings rate, as the results of this thesis clearly shows. This thesis argues the negative correlation seen can be attributed to the lack of demand amongst the general citizen

for sustainability, as a notion that egalitarian democracy *itself* causes less sustainability seems theoretically unlikely. It is thus key to look at *how* demand for sustainability is shaped, which this thesis argues can, in part, be attributed, in part, to income and social capital, without explicitly exploring these relationships empirically. One way forward for future work would thus be to delve deeper into how living in an egalitarian democracy shapes our behaviour, and how environmental sustainability competes against other societal priorities, such as wealth creation, and jobs etc., in an egalitarian democracy. *If* people start caring for the environment, egalitarian democracy will be a great facilitator of sustainability.

6. References

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