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Harm, Freedom and Responsibility – A Descriptive and Normative Comparative Analysis of Intergenerational Justice in the OECD

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Key Concepts

- Intergenerational Justice
- Justice
- Climate Change
- Ecological Footprint
- Sustainability
- Child Poverty
- National Debt
- Social Spending
- Ageing
- Generational Contract
- Harm
- Autonomous Freedom
- Locke

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List of Abbreviations

Abbreviation	**Term**
Benelux	Belgium, the Netherlands, and Luxembourg
CAT	Climate Action Tracker
CO_2	Carbon dioxide
EBiHS	Elderly Bias in Health Spending
EBiSS	Elderly Bias in Social Spending
ECEC	Early Childhood Education and Care
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GDP	Gross Domestic Product
GHA	Global Hectares
GHG	Greenhouse gas
IJI	Intergenerational Justice Index
IMF	International Monetary Found
IPCC	Intergovernmental Panel on Climate Change at the United Nations
NASA	National Aeronautics and Space Administration of the Unites States of America
NEE ratio	Non-elderly to Elderly Ratio
OADR	Old Age Dependency Ratio
OASR	Old Age Support Ratio
OECD	Organisation for Economic Cooperation and Development
PPP	Purchasing Power Parities
PPPUSD/child	Purchasing Power Parity United States Dollars per child
SOCX	Social Expenditure Database
SUV	Sport Utility Vehicle
UK	United Kingdom
US	United States of America (goes as well for USA)

Summary

Trends of increasing inequalities and housing prices, rising debt levels, stagnating real wages and most importantly the looming climate catastrophe have led to the question whether the current state of politics and economics contributes to intergenerationally injustice. In order to avoid problems of discounting and the restrictive statistical nature of lifetime earnings data, I chose, building on a research framework designed by Vanhuysse (2013), to perform a cross-sectional analyse for five different time points from 1995 to 2015, as well as a trend analysis for individual indicators. Concretely, I analyse 36 OECD countries in regard to four different dimensions with different indicators: an environmental (ecological footprint per person, biocapacity per person, net footprint per person), social (child poverty, child over old age poverty), economic and fiscal (debt per child), and elderly bias dimension (Elder Bias in Social Spending). Furthermore, I perform a cross-sectional and a trend analysis on a joint indicator that combines one indicator from each dimension. In order to put the results of that analysis into a moral context – needed to discuss the results in the context of justice – I derive criteria for analysis based on different moral constructs, the most important of those for the analysis are: a harm focused Lockean proviso, a construct of autonomous freedom following Dierksmeier (2006), and lastly the *social connection model* by Young (2011). The first two are based on widely accepted moral constructs and help to discern injustice and moral failure, while the third offers tools to discern the distribution of moral responsibility in society. The study therefore relies on both a descriptive statistical analysis using cross-sectional and trend analysis, as well as a moral assessment of those results. I find that in most indicators things have gotten worse. The net footprint has increased over the long trend, as have child poverty and the debt per child ratio. Only the EBiSS indicator has seen a light trend towards more balanced social spending. I furthermore find large differences in country performance in all indicators and significant differences in the performance of different welfare regimes, with the social democratic regime performing best on average. These country and regime differences are also mirrored in the performance on the joint indicator. In the moral analysis I find that in the case of the first two dimensions, most or all countries can be described as being in violation of their moral obligations, while I am only able to make conditional statements on the latter two dimensions. The discussion with the *social connection model* posits the responsibility to alleviate the issue mostly among the richer and more politically powerful parts of society. Based on this moral analysis I show that the study of intergenerational justice is heavily tied to issues of income inequality and the unequal distribution of resources in society, meaning that the discussion of intergenerational justice always has to include the divide between the rich and the poor.

Chapter 1 – Introduction

This master thesis is motivated by the question whether policy outputs and outcomes in member states of the Organisation for Economic Cooperation and Development (short OECD)[1] render the current state of politics, the economy, our use of the environment, etc. unjust in an intergenerational context. Next to trends in increasing inequalities in income and wealth (Wehler 2013; Autor 2014; Kersbergen and Vis 2014; Hanushek et al. 2015; Garland 2016) and increases in stress and mental illnesses (Marklund 2013), there are developments that warrant the question whether we are observing symptoms of rising inequalities and injustice between generations, leaving the current young generations at a disadvantage (Gründinger and Müntefering 2020; Sittinger 2020). Debt levels in the OECD have been increasing over the last decades (World Bank 2019g) and child poverty rates are high and increasing in some countries (OECD Family Database 2020). Furthermore, we are observing rising housing prices, stagnating real wages, unfavourable labour market conditions such as an increase in the market share of part-time work positions and increasing labour market segmentation, consistent austerity policies, as well as an increase in the rate of in-work poverty and re-commodification of workers (Busemeyer 2015; The Economist 2016; Spannagel et al. 2017; Keller and Seifert 2018; Sustala 2020). In addition, rising pension expenditures driven by an increase in the elderly population (Crawford and Emmerson 2017; Sustala 2020), and most importantly the growing concerns about the consequences of the climate crisis (IPCC 2018) pose serious questions to whether current young generations are at a disadvantage compared to their parents and grandparents, and whether this constitutes intergenerational justice. It could for example be argued that the overuse of the earth's yearly emission budgets nowadays and in the recent past reduces the welfare of currently young generations and endangers the living standards of coming generations.

A report by Pieter Vanhuysse (2013) for the Bertelsmann Stiftung analysed this issue along four components: an environmental, social, economic, and fiscal, and a pro-elderly bias dimension. The report offers a snapshot insight into the issue of intergenerational justice and shows a significant bias towards the older generations especially in social spending. However, due to its cross-sectional nature it is hard to make any conclusions as to whether this pro-elderly bias constitutes injustice or is part of the social generational contract – a partly official and partly unofficial contract that determines the distribution of resources between generations throughout everybody's life cycle – and will benefit the young generations later in their life. This concern for inequalities between generations has also been picked up by other researchers. Chauvel and Schröder (2014, 1259) for example "show that among cohorts born between 1935 and 1975, cohorts born around 1950 are significantly above the income

[1] A table of the member states of the OECD at the time this research was started can be found in the appendix, see table A.2.

trend in most countries." However, since their research relies on lifetime earnings data, the methodology cannot be used to analyse the intergenerational justice between today's young generations and their parents and grandparents, since former have either not entered the labour yet or have only spent a short amount of time in it.

In this thesis I will therefore concentrate on a number of cross-sections that span over 20 years (between 1995 and 2015) and on time series data to explain longer trends in individual indicators and a joint indicator that combines them, building on the four dimensions introduced by Vanhuysse (2013)[2]. This is followed by a study of a small number of interesting cases in the sample. After the statistical analysis of developments I will then apply normative frameworks to answer the question whether the developments constitute intergenerational injustice. This leads to the following research questions: (1) *How do OECD countries perform on the Intergenerational Justice Index (joint index of ecological, social, and economic-fiscal measures, combined with a measure on an elderly bias in social spending) compared to each other (and over time)?* (2) *Which developments can be seen in the disaggregated data of the four dimensions?*, and (3) *How do the developments fit into a framework of intergenerational justice and do they constitute a case of injustice?*

This thesis is split into several chapters. Having introduced the research motivation and problem statement in this first chapter, chapter 2 will present a review of the literature on intergenerational inequalities, a theoretical discussion on intergenerational justice and a review of the key schools of thought, and a review of the literature on the four dimensions used in the study. Chapter 3 will then contain a description of the data used in the study as well as the research design and will show the limitations and advantages of the approach. Chapter 4 contains the data analysis with descriptive statistics along the lines of the four indicators, a digression on health data, and an analysis of a few small case studies. Chapter 5 then, building on the normative frameworks introduced in chapter 2, discusses the results of the analysis, and its consequences. The last part of the thesis, chapter 6, then offers a conclusion and an outlook on how to extent the research.

Chapter 2 – Literature Review and Theory

Subchapter 2.1 delivers a broad theoretical and empirical review of the literature on intergenerational inequality and the developments in the distribution between generations, as well as a review of central

[2] The indicators are the net footprint per person, the child poverty rate, the debt per child ratio and the Elderly Bias in Social Spending. The joint indicator is an indicator that combines the relative performance in all four dimensions. A more detailed explanation can be found in chapter 3.

moral theories of intergenerational justice. Subchapter 2.2 delivers a theoretical and empirical review of the literature behind the four dimensions (and indicators) of analysis used in this thesis (the environmental, the social, the fiscal and economic, and the elderly bias dimension).

2.1 Intergenerational Inequality, the Distribution Between Generations, and Intergenerational Justice

The research surrounding intergenerational inequality often faces the challenge of having to estimate and discount future developments in order to make them comparable to the current situation. Two common strategies (to sidestep this) are therefore to either look at life time data and birth cohorts, or to make a cross-sectional "snapshot analysis" and look at age groups to see how they are affected by public policies (Vanhuysse and Tremmel 2019, 2). A very promising insight can, for instance, be gained from the literature looking at life time earnings of different cohorts, as carried out in the aforementioned paper by Chauvel and Schröder (2014). The authors compare intergenerational inequalities between the different welfare regimes, by comparing earnings to the income trend, and find that these inequalities are "much stronger in conservative, continental European welfare states, compared to social democratic and liberal welfare states" (Chauvel and Schröder 2014, 1259). This approach can be applied at least for those cohorts that have completed their participation in the labour market and are retired now. For later cohorts, the issue is highly dependent on the discount factor and any result would not be particularly trustworthy, considering the unpredictable economic developments that could cause incomes to rise or fall (sometimes drastically).[3] The results of any analysis that is based on future welfare, monetary and labour market developments and their discounted current values is highly sensitive to minor changes in the parameters. It is therefore exceptionally hard to make reliable statements about the welfare of future generations, for example by looking at long run economic effects of population ageing (Creedy and Guest 2009). Attempts of such an analysis have nevertheless been undertaken, and they show a gloomy picture for the next 45 to 50 years. A report on public spending in the United Kingdom (short UK) shows that population ageing is going to cause a drastic increase in state spending on pensions and health and social care until 2066 (Crawford and Emmerson 2017). The authors show that the extent of this increase heavily depends on the way pensions are indexed, claiming that the pressure on the pension system would be a lot smaller with a single link to earning levels instead of linking pension growth to "the highest of the growth in average earnings, inflation and 2.5%" constituting a "triple lock," pulling spending up at a higher speed (Crawford and Emmerson 2017). This development could cause the state to be forced to make decisions between increasing state spending or cutting spending in other areas to accommodate the

[3] Economic crises, like the one we are currently experiencing in many countries due to the pandemic, can come unexpected and have lasting impacts on incomes and the economy in general.

increase in pension and health spending. This would either mean that non-elderly cohorts would have to pay ever growing pension contributions to fund the pensions or would suffer losses elsewhere.

Further issues that motivate the research on intergenerational inequalities are the aforementioned trends in increasing income inequality, long term increases of housing prices, a weakening of labour market regulations and an increase in the number of the working poor. Combining many of these trends in an analysis of intergenerational inequality, a recently published book by Sustala (2020) focuses mostly on how the millennial generation is at a disadvantage compared to its predecessors. Sustala points, for example, to the increasingly precarious conditions on the labour market and the devastating consequences of the Great Recession, which can lead to losses in life time earnings and affect people's decisions towards buying real estate or starting a family. Arguing that these circumstances were worst for the millennials – compared to the two prior generations – Sustala claims that the crisis caused significant intergenerational inequalities. He also offers some insights supporting the claim of increased pressure on pension systems caused by the demographic change: Germany, for instance, would need to welcome a net of 1.5 million immigrants per year in order to stabilise the old age dependency ratio (short OADR) until 2060 (Sustala 2020).

Contrasting the overall positive developments for human wellbeing and living standards with other developments for workers and individuals can help shed more light on the situation. A report by the McKinsey Global Institute shows overall improvements in economic development, improvements in technology and lower prices for consumer goods, but also developments such as work polarisation, income stagnation, hikes in housing prices, and people's growing inability to save for retirement (Manyika et al. 2020). The authors ask, "how the social contract has changed in the 21st century" and conclude that "individuals have had to assume greater responsibility for their economic outcomes" (Manyika et al. 2020). This development can be read as a rise in the commodification of individuals, meaning, as Esping-Andersen puts it, an increase in the extent to which "our well-being came to depend on our relation to the cash nexus" (Esping-Andersen 1990, 35). Especially the findings of a growing income inequality combined with stagnating real wages and rising poverty rates after taxes are cause for concern (Manyika et al. 2020). In a summary on their findings, the authors of the report state the following: "Young people between 15 and 30 years old have less access to well-paid stable employment, affordable housing, and decent savings, compared to previous generations" (Manyika et al. 2020).

The aforementioned report by Vanhuysse (2013) draws several cautious conclusions based on a cross-sectional analysis of the (ecological) net footprint per capita, the child poverty rate, the national debt per child and an indicator for a spending bias towards elderly generations. Firstly, there are large differences among the OECD countries and the degree to which they can be described as

intergenerationally unjust – with for example Estonia, South Korea, and the Nordic countries performing best and the United States and Japan performing worst. Secondly, debt levels that become very high can be a risk for future generations, but only if they prevent investments into the future. Thirdly, a particularly high bias in social spending towards older generations can be viewed as an indicator of intergenerational injustice. However, the evidence is not sufficient to make strong judgements. Vanhuysse therefore points out the need to study "further snapshots encompassing past and future points in time" (Vanhuysse 2013, 39).

The Environment and Intergenerational Justice

I will start the review of the literature on intergenerational justice with a discussion of the literature on the justice issue in the environmental dimension, as it is the biggest of the four dimensions, and then move towards general theories of intergenerational justice.

A joint report by the Rockefeller Foundation and The Lancet describes the situation quite bluntly and states that "we have been mortgaging the health of future generations to realise economic and development gains in the present" (Whitmee et al. 2015, 1973). The authors describe the use of the world's resources as unsustainable and point to increasing health risks (Whitmee et al. 2015). The use of the words 'sustainability' and "mortgaging' already hints at how man-made climate change is connected to intergenerational justice, a notion that has been pioneered by the so-called Brundtland Report, stating that "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development 1987). By overusing the earth's resources, humanity has brought on a development whose impacts will be severely unequally distributed, between people, but also between generations, as the impacts are expected to grow worse over the time of the current century and beyond. This idea of overusing – implied with the terms 'mortgage' and 'unsustainability' – is also furthered among other scholars. Gough (2017), for example, describes a moral construct with the aim to define who has a claim to emissions by comparing the level of human needs with a carbon budget. His conclusion is straightforward: if one person consuming over the necessary level "cannot be accommodated in the global carbon budget," then this person has no just claim to the emissions (Gough 2017, 87). This assessment is based on a distinction between levels of emissions needed to either satisfy "human needs" or "consumer preferences" (Gough 2017, 87). The construct reads as follows: human needs have moral superiority over consumer preferences. The latter ought to only be allowed to be satisfied if the former are not at risk. His analysis goes (even) further and elaborates on the distribution of the responsibility for climate change and for fighting it. According to his analysis,

high income countries are responsible for about 66 percent of the cumulative emissions, while they share about 80 percent of the capability to fight climate change – i.e. through their ability to "fund the necessary mitigation efforts" (Gough 2017, 100). Gough uses this data to put the obligation to fight climate change mainly on the high income countries.

Pointing to the connection between economic growth and emissions Shue (1993) argues that, due to the persistence of high poverty rates and living conditions below a decent standard in much of the Global South, Europe and other high income countries cannot expect the Global South to throttle their emissions. We can see a similarity here to the arguments by Gough, both claiming that there is a moral responsibility to lower emissions for those who can do so without dropping below a decent standard of living that accommodates the human needs, and for those who contributed more to the problem. Besides the question of who would be responsible (to abate emissions), Shue then also addresses the question whether current generations have a moral responsibility to fight climate change at all. He presents two arguments that go beyond a fixed linear model of fairness.

The first argument is that problems such as climate change can "grow more intractable, or even become insoluble, over time," (Shue 2014, 17) meaning that a failure to mitigate climate change to a certain degree today will not increase the mitigation burden future generations have to carry by the same amount, but probably by more, simply because the problem has gotten worse in the meantime. It will therefore increase the amount of emissions they have to cut in the first place, while costs of adaption are also expected to rise due to this failure on account of the current generations. Shue's second addition is the argument that inaction nowadays also worsens the impact of climate change in the future. He claims that by worsening the living conditions of future generations "we violate not only the imperative to 'Be fair' but also the prohibition to 'Do no harm'" (Shue 2014, 18). Failing to combat climate change nowadays will increase the severity of the impact for all future generations and cause harm, "a violation of what is arguably the most fundamental moral principle of all" (Shue 2014, 235). Shue argues that the responsibility becomes clear when one considers the following scenario: if all coming generations do their best to fight climate change, all the while ensuring no harm is being done to themselves by their abstinence, "then how bad climate change becomes at its worst turns on how much we do now" (Shue 2014, 236-237). This difference in the level of severity means that there is harm that can be prevented by current generations by acting differently. With this discussion, Shue goes beyond a concept of "distributive justice" that simply deals with "doing our fair share to solve any common problems" (Shue 2014, 230).

Lockean Approach

Building on Locke's proviso that "'enough and as good' is left for others," Wolf (1995, 794) argues that it is possible to extend it to the problem of intergenerational justice in a way that can be widely

accepted by most moral interpretations. He proposes to interpret the proviso as a harm principle and argues that building on the commonly accepted notion to 'do no harm' can turn the proviso into a sound ground for a moral assessment of intergenerational relations. Which forms of appropriation would then be considered harmful under this principle? Wolf's answer is threefold:

> "1. The claim to appropriate is based only on adventitious needs. That is, the resources in question are not needed for survival and are not necessary to live a decent human life.
>
> 2. The claims of others are justified by reference to basic needs. That is, they need the resources in question to survive and to live minimally decent lives.
>
> 3. No other morally relevant claims on these resources exist." (Wolf 1995, 808)

These conditions can lead us to the obligation of not harming subsequent generations and the obligation of using our resources in a sustainable way. The third point in Wolf's answer can be seen as a hint to the 'morally relevant claims' of people in the current generations who are still suffering from poverty. The move towards sustainability therefore has to take into account the current distribution of incomes and the prevalence of poverty, which can very well constitute competing moral claims to the resources, a situation which also has to be assessed under the harm principle.

Rawlsian Justice or Ideas of Freedom

Another assessment of Rawlsian theory for the application to intergenerational justice comes from Claus Dierksmeier (2006). Dierksmeier argues that by focusing only on the self-interest maximising individual and by rejecting any metaphysical assumptions, Ralws' original work *A Theory of Justice* cannot offer a claim for obligations towards future generations. He argues that this is due to the "asymmetrical obligations that correspond" to any rights of future generations: anyone not born yet cannot partake in the deliberation in the original position and defend their interests (Dierksmeier 2006). Contemporaries would therefore have to cut back on their self-interest without receiving anything back from future generations. Further attempts by Rawls to include additional conditions that presuppose a moral interest within the individual are, as Dierksmeier says, in violation of Rawls' own concept and would topple the whole theory. His counterproposal – building on Kant's ideas on *humankind* - then revolves around the ideas of autonomous freedom and ties the responsibilities in ourselves instead of tying them to specific violations committed against the condition of another individual (Dierksmeier 2006). With this approach Dierksmeier extents the obligation towards others beyond the simple concept of needs, includes as a condition the "potential to live our lives according to our own designs" (Dierksmeier 2006, 83) and avoids the problem of asymmetry and non-reciprocity found in Rawls' theory. Following the Kantian tradition, he argues that freedom itself is not unlimited, such that a person is not 'free' to do and use infinite resources as they please, potentially destroying other people's livelihoods. Justifying this argument, he concludes that the conditions of freedom – a qualitative freedom that is limited by design to allow for the freedom of other people – cannot be

rejected without ending in self-disputation: “to reject autonomous restrictions on liberty, be it in the name of unrestrained freedom invokes a self-contradiction [since it] presupposes the respect of others for our free deliberation and decision-making, and yet argues against the maintenance of the general conditions” (Dierksmeier 2006, 83). With this approach, Dierksmeier successfully builds a moral obligation – centred in our own freedom – to respect the autonomous freedom of anyone in our “moral community” (Dierksmeier 2006, 82), regardless of their temporal or spatial position.

Similarities to this theory can be found in Sen’s work *The Idea of Justice* (Sen 2009). Sen also goes beyond the simple idea of human needs and directs the obligations towards the quality of life of future generations and to maintaining sustainability. Instead of the *autonomous freedom* introduced by Dierksmeier, Sen formulates the obligation to not only sustain the standard of living, but also to sustain “people’s freedom and capability to have – and safeguard – what they value and have reason to attach importance to” (Sen 2009, 250). We can a find a similar approach – also positioning the obligation in the individual – with reference to a moral community extending over time in the work of De-Shalit (2005), namely the communitarian theory of intergenerational justice.

The Social Connection Model

To conclude this subchapter, I would like to draw on an approach towards structural injustice by Young (2011). The approach revolves around two models: the liability model and the social connection model. Young’s widely accepted liability model ties responsibility for actions that are “directly causing harmful outcomes” to those who are committing the action “voluntarily and with adequate knowledge of the situation” (Schweiger and Graf 2015, 123). However, we often find ourselves in an overly complicated world with structural responsibilities for injustice, and as Young herself puts it, “structural injustice is produced and reproduced by thousands or millions of persons usually acting within institutional rules and according to practices that most people regard as morally acceptable” (Young and Nussbaum 2011, 95). Young’s *social connection model* addresses that issue by proclaiming that everyone “contributing to structural processes that lead to unjust outcomes shares [responsibility]” (Schweiger and Graf 2015, 124) and the extent of this responsibility depends on a number of factors, for example power and privilege. This makes it easier to assess how responsibilities for unjust outcomes can be distributed in society.

2.2 Review of the Empirics and Theory Behind the Four Dimensions

Environmental Dimension

A rather straightforward case can be made for the application of the environmental dimension. An overwhelming amount of scientific research has shown the human impact on the global warming and the climate catastrophe. The last comprehensive report by the Intergovernmental Panel on Climate Change at the United Nations (short IPCC), showcases the impact of global warming of 1.5 or 2 degrees Celsius compared to pre-industrial levels on various social and economic indicators related to economic development and social welfare (IPCC 2018). An increase in greenhouse gas (short GHG) emissions over the last decades has not only worsened the threat of climate change, it also reduces the amount of emissions that future generations can use without risking to deteriorate the situation even further. This is based on the scientific consensus that stopping global warming or keeping it at a safe level "requires net anthropogenic CO_2 emissions to be reduced to zero [and that] total allowable CO_2 emissions for any given temperature target are finite" (Matthews et al. 2018, 3). Especially major contributions to this warming trajectory by the OECD and other highly industrialised countries have been increasing over the last decades, as shown by a study on "international ecological footprint inequality," (Teixido-Figueras and Duro 2015, 30) which highlights that economic growth has increased the national ecological footprint per capita and worsened "intergenerational equity" (Teixido-Figueras and Duro 2015, 31). The longevity of CO_2 in the atmosphere implies that even a complete stop of GHG emissions in the next years (entertaining for a moment this unattainable hypothetical situation) would not stop global warming, since we have already locked in a warming trajectory towards 1.5° C or higher (Shue 1993, 2014; Gough 2017). Estimates from 2019 put the global temperature increase compared to pre-industrial levels already at 1.1°C (World Meteorological Organization 2019).

However, the issue here is not only with past emissions, but also with the fact that most countries are far from reaching zero net emissions any time soon. Assessments of the current policies and emission pathways have shown that the world will clearly miss the targets set in the 2015 Paris agreement. The Climate Action Tracker (short CAT) predicts an increase in global temperature at the end of the century by 2.8°C with the current pledges made by governments and by 3°C looking at the actual policies (Climate Action Tracker 2019). The CAT data also shows the climate action performance of different countries and the warming trajectory this would translate into if theirs was the average global climate action performance. Two of the biggest OECD countries in terms of population size, USA and Turkey are ranked as *critically insufficient* (with a warming trajectory of more than 4°C), with Chile, Germany, Japan and South Korea being ranked as *highly insufficient* (warming trajectory between 3 and 4°C), while the remaining OECD countries in the CAT sample and the EU are ranked *insufficient* (warming trajectory between 2 and 3°C). The six OECD countries in the *critically* and *highly insufficient* category

make up around 50% of the OECD population (World Bank 2019d) and around 60% of the economic output of the OECD (OECD 2020b), and have a major impact on climate change, due to their economic power and their population numbers. This is a worrying development as the IPCC states that an increase beyond 2°C or even 1.5°C would lead to "severe and widespread impacts" or "very high risks of severe impacts and the presence of significant irreversibility […] combined with limited ability to adapt due to the nature of the hazards" (IPCC 2018, 11). It therefore becomes apparent that besides the argument that the overuse of a limited carbon budget will constrain resource use in the future, there is a more and more clear case to be made for the direct effect of climate change on human welfare already today in OECD countries. The next paragraphs will briefly outline the different effects climate change already has today and how it will affect humans even stronger in the coming decades.

To name just a few examples, climate change has been proven to have caused or to have worsened the impact of environmental crises and disasters around the OECD with wildfires in California, Scandinavia and Australia, droughts, and heatwaves in many western countries, as well as major floods, and many more. All these effects have strong negative impacts on many different indicators of human health, wellbeing, economic development, habitat and soil stability, social deprivation, and climate change itself, as shown in many reports (Borunda 2018; EPA 2016; FEMA 2019; Hausen 2020; Hughes et al. 2020; McGreal 2019; Williams et al. 2019; Wing et al. 2018; World Weather Attribution 2018).

In an extensive report from the beginning of this year, the McKinsey Global Institute summarises the extent to which climate change will affect human life (Woetzel et al. 2020). The authors state that we will see a growing influence of climate change that will not be easily predictable, will exacerbate inequalities, will grow faster after hitting certain points of no return, will cause ripple effects between different locations, and will catch us humans mostly unprepared for the task of tackling it and mitigating it's consequences, as warnings have gone unheeded for many decades (Woetzel et al. 2020). With special relevance to the topic of this thesis is the finding that climate change will act as a multiplier for inequalities: the richer a community, the better it can protect itself against the physical risks of climate change. This is due to differences in the level of preparedness and the financial means to react after the physical risk turns into actual impact. For countries that are less economically developed and are at higher risk of strong impacts, this can mean ecological and humanitarian disaster and eventually whole regions can slide into chaos, endangering global supply chains and food supplies (Kleber and Paskal 2012; World Bank 2012).

A common misconception is that OECD countries will be barely affected by climate change in at least the coming decades.[4] In addition to direct impacts, some of which are described in the previous paragraphs, the OECD countries will also feel indirect impacts of climate change, exacerbated by a highly globalised world. Different reports (IPCC 2018; Woetzel et al. 2020) mention risks to food systems worldwide, pointing to worsening weather patterns, increasing droughts and other factors that endanger the safety of food supplies around the world. While there might be some improvements in for example the length of planting seasons, the average effect is expected to be negative. Another important issue concerning human welfare is the vulnerability of supply chains, which "are often designed for efficiency over resiliency, by concentrating production in certain locations and maintaining low inventory levels" (Woetzel et al. 2020). Many OECD countries obtain a significant part of their food from abroad and will therefore feel the indirect impacts of climate change on their standard of living (Eurostat 2017; U.S. Food and Drug Administration 2019). However, not only global trade is on the line when it comes to climate change. Low water levels in the Rhine in the last years, have had a measurable impact on Germany's GDP, showing that companies are already affected by climate change (Ademmer et al. 2019; Pinner and Sneader 2019; Schirmer 2019; Woetzel et al. 2020). These developments matter because economic losses of companies do not remain in a vacuum, but usually translate into hardships for workers and the society, with lower tax revenues, higher unemployment, higher goods' prices etc.

Nevertheless, one could argue that more emissions will be necessary to make sure that nobody on the planet has to live a life in poverty and suffer from material and social deprivation. According to Gough (2017) any policies aiming for a sustainable approach on the basis of justice or obligations towards future generations also have to take into account this task of ensuring a decent life for everyone currently alive. The importance of finding the path between those two obligations becomes obvious when one looks at how climate change is expected to severely slow down and at some point even reverse the general upward trend in the Human Development Index (United Nations Development Programme 2011). Gough therefore argues for policies of sustainability that put the responsibility to act mainly on the rich countries and recommends a move to post-growth politics with a steady state economy, falling in line with other scholars making a case for decoupling prosperity from growth (Jackson 2013; Klein 2014). He describes a situation in which the flow of the economy "must lie within the regenerative and assimilative capacities of the ecosystem" (Gough 2017). In an effort to show the big impact of seemingly minor changes for individuals in richer countries on the carbon budget of people in poorer countries, the World Bank compares carbon emissions of automobiles in the Global

[4] While there are definitively differences in the level of threats and in the vulnerability of ecosystems, it also has to be noted that over 80 percent of the population of the OECD lives between the 30 degree and 75 degree northern latitude, regions, for which the NASA reports higher average warming than in countries closer to and south of the equator (GISTEMP Team 2020; Lenssen et al. 2019; World Bank 2019d).

North to carbon emissions of electricity in the Global South: “Switching from SUVs to fuel-efficient passenger cars in the US alone would nearly offset the emissions generated in providing electricity to 1.6 billion more people”, referring to an estimate of 40 million sport utility vehicles (short SUV) in the United States of America (short US) (World Bank 2010, 3).

Social Dimension

Turning to the social dimension, Vanhuysse uses child poverty rates as an indicator. The use of this indicator is motivated by research showing the harmful effect of poverty on children, effects that can sustain long after childhood and when the individual has escaped poverty. In his ground-breaking book on the effect of material and social deprivation on child wellbeing, Heckman (2013) describes the long lasting impact on child development and how that, for example, affects the brain size of young children. In addition to those developments he, for example, describes a higher prevalence of adult health risks and low life time earnings as being correlated with children suffering under “adverse childhood experiences” (Heckman 2013, 20). This research is corroborated for example by Putnam (2015) in his work on the growing inequality in the United States, in which he describes how childhood experiences influence nearly every aspect of adolescent and adult life. It becomes especially clear from his research, how deprivation in childhood and adverse experiences can put children at a disadvantage throughout their life, when it comes to earnings, health, social networks, and other aspects.

Special relevance of this indicator also arises when one considers the development of child poverty and material deprivation since the second world war. Large improvements in the standard of living over the last century seem to have not reached everyone equally and left many children to live with material deprivation. In the United States for example, after improvements in the first decades after the second world war, child poverty began increasing again in the 1980s (Fuchs and Reklis 1992). In a more general assessment, waves of austerity and especially the Great Recession appear to have reversed some progress in this area. Chzhen et al. show how an economic crisis affects household incomes through different channels of work, investments, and taxes and transfers, and “poses longer term risks to child well-being through reduced family investment in child nutrition, health, education, and leisure and social activities” (Chzhen et al. 2017, 8). According to their studies, the crisis and the ensuring waves of austerity affected child poverty very differently across Europe. While some countries in Northern and Western Europe were able to lower child poverty rates, the rates increased in a majority of countries and some even saw quite substantial increases (Chzhen et al. 2017). Corresponding research on child policy and early childhood investments by Vanhuysse (2015) shows worrisome increases (between 2005-2007 and 2011-2013) in the share of children under 6 years old who suffer severe material deprivation, especially in countries that were strongly affected by the Great Recession and the following European debt crisis, like Greece, Spain, the United Kingdom and Ireland.

Economic and Fiscal Dimension

The third dimension – measured here with public debt per child – and its difficulties have been extensively discussed by Vanhuysse (2013) and I will therefore not go into too much detail here. Nevertheless, it is worthwhile to deliver a short summary on the relevance to intergenerational justice. The indicator builds on the intuitive notion that high debt levels will prevent investments into the future of the country, may it be in infrastructure, education, green technology or other things, a notion that is supported by other researchers (Kotlikoff and Burns 2012). Why this can be problematic, is demonstrated, for instance, by the public discussion in Germany over the last few years surrounding the idea of the "Schwarze Null" (translation: black zero), which prevents the state to make more investments due to the need and the objective to not increase the national debt (Bundeszentrale für politische Bildung 2020). More specifically, this means that the federal state is required to prevent a state deficit. Similar instruments can be found in many other European countries who have implemented such instruments to comply with the European *Stability and Growth Pact*, prohibiting public debt and deficits to cross certain levels. In a worst case scenario, the accumulated public debt not only prevents future-oriented state investments but can also lead to a near breakdown of the public system, like in Greece and other Mediterranean European countries during the European debt crisis starting in 2012.

Elderly Bias Dimension

The fourth dimension used in the study is slightly more complicated to analyse. The *Elderly Bias in Social Spending* (short EBiSS) indicator compares countries by the ratio with which they devote public spending to the older generations (people over 65) compared to the public spending that goes to the people younger than 65. Different studies show that the spending ratio can be increased by population ageing, but that population ageing will not necessarily be the best factor to explain differences between countries (Tepe and Vanhuysse 2009, 2010; Vanhuysse 2012). It is therefore unclear whether a high bias in this dimension constitutes intergenerational injustice or whether this is simply an expression of the generational contract, assuming then that every individual will go through the different phases of giving and receiving. Different studies show, however, that "currently older generations receive more overall public transfers, and currently young and working-age generations much less, than generations that were old in past decades" and that the spending bias in favour of the elderly generations has increased in many countries (Tepe and Vanhuysse 2010; Vanhuysse and Tremmel 2019).

Chapter 3 – Data & Methodology

This thesis consists of a statistical approach and a theoretical discussion building on moral concepts to appraise the results of the data analysis in a context of intergenerational justice. In this chapter I will therefore first describe the data characteristics (3.1), then the methodology (3.2), and close with a subchapter on the limitations and the advantages of the research method (3.3).

3.1 Data Characteristics

The statistical approach to this thesis will be mainly descriptive and compare trends in different indicators across the OECD. Building on the frame of the study conducted by Vanhuysse (2013), I will use indicators in four dimensions that are nearly identical to the indicators of the original study and look at those measures in the time period between 1995 and 2015.[5] For the first dimension, I will use the ecological footprint per person, the biocapacity per person and the net footprint per person. The choice to also look at the ecological footprint per person builds on the literature and scientific research pointing out the urgency of reducing greenhouse gas emissions and I argue that a reduction of the absolute footprint has to take place, especially considering that biocapacity has remained constant or decreased in most countries.

The data for the ecological footprint and the biocapacity is provided by the Global Footprint Network (2019). The data shows how many ecological resources the country needs per person to "produce the natural resources it consumes (including plant-based food and fibre products, livestock and fish products, timber and other forest products, space for urban infrastructure) and to absorb its waste, especially carbon emissions" (Global Footprint Network 2019). This indicator, contrary to the national emissions, shows the environmental impact of what the country actually consumes. The biocapacity "represents the productivity of its ecological assets (including cropland, grazing land, forest land, fishing grounds, and built-up land). These areas, especially if left unharvested, can also absorb much of the waste we generate, especially our carbon emissions" (Global Footprint Network 2019). The net footprint is the ecological footprint minus the biocapacity, meaning that in a country with a positive net footprint, the ecological footprint is bigger than the biocapacity. All three indicators are given in the comparable measure global hectares per person. Except for Iceland, where data is missing, this indicator covers all the time periods between 1995 and 2015 and all member states of the OECD. For the time periods between the early 1960s and the mid-1990s, which will not be used in the analysis of the joint indicator *intergenerational justice index* (explanation follows) but will serve as statistical

[5] The calculation for the four indicators is mostly borrowed from original study, with the exception of the computation of the EBiSS value, for which I use a different population ratio. I elaborate on the differences between the designs in the paragraph for each indicator.

context, there is data available for 29 OECD member states, with most of the states of the former Soviet Union missing.

The second indicator is the child poverty rate. This measure tells us how many people under the age of 18 are at risk of poverty, by falling under the poverty line of 50% of the median household income of the country, after taxes and transfers.[6] The data for this indicator is provided by the OECD Statistics Income Distribution Database (2020) and it contains data on all 36 member states for the time slots 2005, 2010 and 2015. Ten countries are missing in 1995 and nine in 2000. The same database (OECD Statistics 2020) also provides data for the poverty rates of people over the age of 65, namely the percentage of people over 65 who fall under the poverty line of 50% of the median household income. Here we only have exhaustive data for the years 2010 and 2015.

The third indicator is the public debt per child. I will construct this indicator by dividing the level of general government gross debt (at nominal value)[7] by the number of people between 0 and 14 years old. For this, I use debt data in national currencies from the World Bank's *TCdata360 database* (World Bank 2019g). To make the data comparable between countries, I use annual purchasing power parities (short PPP) that give a conversion rate in National Currency over US Dollars that takes into consideration different price levels between the countries. The data for this is supplied by the OECD (OECD 2020d). The last part of the equation is the population data from the World Bank (2019e) which gives the total number of people between the ages 0 to 14. While four countries are missing in the data base for 1995 (Latvia, Lithuania, Turkey, and Israel), the data is available for all 36 states for the years 2000, 2005, 2010 and 2015.

The fourth and last indicator is the EBiSS indicator, designed by Vanhuysse (2013). It looks at the ratio of public social spending for the elderly (65+ year olds) over social spending to the non-elderly (0-64 year olds). The data for the social spending is taken from the OECD's Social Expenditure Database (short SOCX) (OECD Statistics 2019) and shows the yearly expenditures on pensions, family policy, unemployment programs, etc. The data on education is taken from the World Bank's Education Statistics database (2019b) and shows the general expenditures on education in US Dollars. This data is then added to the social expenditure data and transformed with exchange rate data from the OECD (2020a). A small number of countries is missing from the World Bank data and is filled in from other data sets.[8]

[6] The 50% line was chosen for reasons of data availability and because it is the specification commonly applied by the OECD.

[7] The nominal value is chosen since the main focus lies on the cross-sectional comparison in the different years. Furthermore, this is the classification commonly used by the OECD and Eurostat.

[8] The data for Greece in 2015 was taken from the German Federal Agency for Civic Education (Bundeszentrale für politische Bildung 2019). The data for all years for the United Kingdom was taken from a report of the

Another part of social spending that is not included in the SOCX database is age-specific spending on health care. The OECD only offers data for this for the Czech Republic in 2009, the Republic of Korea in 2009 and the Netherlands in 2003, 2005, 2007 and 2011 (OECD Statistics). The German office for health reporting (Gesundheitsberichterstattung des Bundes 2020) also published numbers for Germany for 2002, 2004, 2006 and 2008.

To obtain the EBiSS values, I will multiply the spending ratio described above (without the health spending) with a non-elderly to elderly ratio (short NEE ratio) – the population aged 0 to 64 divided by the population ages 65 years and older – instead of using the old age support ratio which divides the working age population by the elderly population, used by Vanhuysse(2013). The population data for this is taken from the World Bank (2019d). The reason for this is the inclusion of public expenditure for children into the EBiSS calculations, which then renders it necessary to take that age group into consideration for the demographic variable as well. This demographic variable is used to make the results comparable and take into account differences in the age distribution between countries as a factor influencing the spending ratio. While three countries are missing in the spending data for 1995 (Estonia, Hungary, and Turkey), the data is available for all 36 OECD member states for the remaining years.

3.2 Methodology

Three of the indicators (footprint, child poverty rate, national debt per child) can be viewed as showing the policy outcomes of the state, while a fourth indicator (EBiSS) can be regarded as showing the policy output by using spending data (Vanhuysse 2013). Similar to the original study, my research will start by using descriptive statistics on all four indicators to portray the status quo and add insights into the trends over the last decades by comparing countries and examining how their performance changed over time. For the environmental dimension, I will look at the long term trends in ecological footprint and biocapacity per person as well as the trend in the net footprint per person and then compare the net footprint per person between countries for the different snapshots. For the social dimension, I will

House of Commons (Bolton 2019). The data for the United States, the Republic of Korea, and Turkey for the years 2005, 2010 and 2015 was taken from the *National Center for Education Statistics* at the U.S. Department of Education (2018b), as well as the data for the United States for 1995 and 2000 (2018a). Two more data points (Luxembourg in 2005 and Greece in 2010) were supplied from Eurostat (2020). However, the data for the US for 1995 and 2000 was incomplete, making the EBiSS values slightly less reliable for those two years and an analysis of the US data should not focus only on those two years. Both the National Center for Education Statistics and the report for the UK House of Commons report some of the data in percentage of GDP, which requires the use of another data set of GDP values for those countries to calculate the dollar value of the education expenditures. For this, I turned to the World Bank for data of the national GDP in current US Dollars (World Bank 2019a). The comparability of the different datasets was double-tested with data points that are available in the main dataset and the replacement data set

look at the trends in child poverty rates and for 2010 and 2015 compare them to the child over old age poverty ratio. For the fiscal and economic dimension, I will look at the trends in the debt per child and especially focus on countries which experienced strong changes. For the fourth dimension, I will start with a digression on the spending ratio in health spending and the impact this would have on the overall spending ratios and the EBiSS values. Then I will compare the EBiSS values between countries in the different snapshots. In all four dimensions, I will add a short comparison of the average performance of the three traditional welfare regimes based on a grouping by van Kersbergen and Vis (2014).[9]

For the next part of the analysis, I will compile the data into the joint indicator introduced by Vanhuysse (2013): the *intergenerational justice index* (short IJI). For the IJI, I will combine the *net footprint*[10], the *child poverty rate*, the *debt per child* and my interpretation of the *EBiSS* values. This is done by normalising the indicators and then applying different weightings and comparing the value for the different countries over time. In order to normalise the indicators, I will use a formula already employed by Vanhuysse (2013). The normalised value (*Vni*) equals the ratio of the difference between the maximum value (*Vmax*) and the country value (*Vi*) over the difference between the maximum value and the minimum value (*Vmin*) in the sample:

$$\boldsymbol{Vni} = \frac{\boldsymbol{Vmax} - \boldsymbol{Vi}}{\boldsymbol{Vmax} - \boldsymbol{Vmin}}$$

This will yield results on a scale between 0 and 1, with the lowest values of the sample taking up the higher values for the normalised indicator. If, for example, Ireland had the lowest EBiSS value for 2010, it would take up the value of 1 in the normalised EBiSS indicator. If, for example, Greece had the highest debt per child ratio, it would take up the value 0 for the normalised debt per child indicator. This normalisation serves the purpose of combining all four indicators in a joint indicator.

For the joint indicator, I will add a feature of my own: a weighting method which puts the most emphasis on the first indicator (the net footprint)[11], which I will compare to an equally weighted joint indicator[12]. This is based on the argument that the ecological dimension can be viewed as the most important indicator due to the effect of climate change on all the other dimensions taken into account in this study. In addition to a descriptive analysis of the trends in the IJI and the positions of the

[9] Liberal regime (Australia, Canada, Ireland, New Zealand, UK, and US); Conservative Regime (Austria, Belgium, France, Germany, Greece, Italy, Netherlands, Portugal, Spain, and Switzerland); Social Democratic Regime (Denmark, Finland, Norway, and Sweden).

[10] For the joint indicator I use the net footprint and not the ecological footprint, because it offers a straightforward assessment to whether the country is overusing its biocapacity or not and therefore offers a better comparison between countries.

[11] This weighting puts a weight of 0.4 on the net footprint and a weight on 0.2 on the three remaining indicators.

[12] This weighting puts an equal weight of 0.25 on all four indicators.

different countries, I will also conduct a short analysis to test the impact of a specification in poverty rates used in the original study. Vanhuysse (2013) used the ratio of the child poverty rate over the old age poverty rate to take into account another aspect of intergenerational injustice (differences in poverty rates among age groups). If this ratio was bigger than one, meaning that the child poverty rate was bigger than the old age poverty rate, he divided the normalised value of the child poverty rate by this ratio of child over old age poverty to account for this inequality. I will employ this specification for the years 2010 and 2015 and observe how this changes the positions in the IJI.

Following the comparative analysis of the four indicators and the joint indicator, I will examine a limited number of small case studies of countries (from different welfare regimes) with either very high IJI values, very low IJI values or good performances on individual indicators. This analysis will require a look at the countries' demographic and policy development during the period of analysis, as well as their performance on individual indicators to explain the developments – for example by comparing their performance to countries with a similar demography.

The next part of the thesis will be to discuss the results under paradigms of justice and intergenerational justice using a number of theoretical concepts following Kantian and Lockean approaches and applying Young's social connection model. This is done to assess in which way the countries' position can be classified as being intergenerationally unjust and how responsibility can be distributed in the society.

3.3 Limitations and Advantages of the Research Design

A major limitation to the explanatory power of the results is the inability of the researcher to compare the cohorts at hand by their life time earnings since most contemporary cohorts are not at the end of their labour market participation. Therefore, this research is restricted to snapshot indicators that can – if observed over longer time periods – be used to make statements about the development of the situation.

A further limitation is the data availability among the indicators selected for this thesis. While the ecological footprint offers sufficient data to observe long term trends (with data for most countries from 1961 to 2015), the other indicators can only be sufficiently observed in the last twenty years and therefore restrict the analysis to a shorter time frame, namely between 1995 and 2015. Concerns could also be raised about the vulnerability of the child poverty indicator to changes in the overall standard of living in the society, especially during large crises. However, research by Chzhen et al. (2017) shows

that the effect of crises are relatively similar, whether one uses the nominal child poverty rates or base years to obtain a more stable poverty rate.

Concerns regarding the unavailability of age-specific health spending have to be tested using the data for the Netherlands, the Czech Republic, the Republic of Korea, and Germany to see whether the spending ratios change much when the data on health spending is included. If the impact of this inclusion is very big, this could leave doubts about the explanatory power of the EBiSS value, due to the large share of health spending in the overall social spending.

The strength of the research design lies in the broad approach taking into consideration ecological, social, fiscal, and social spending factors. Especially the inclusion of the ecological footprint data adds to the value of the research due to the indirect effect of climate change on the other indicators. A further strength is the differentiated approach that looks at all indicators first separately and then in a joint manner, allowing space for a detailed analysis of outliers. By basing the assessment of the results on normative frameworks, I ensure that no confusion arises over the meaning of high or low values of the different indicators, e.g. the EBiSS. While a high EBiSS value would point to an unsustainable social policy, it is first and foremost an expression of the generational contract in the respective country and has to be assessed carefully to prevent premature judgements.

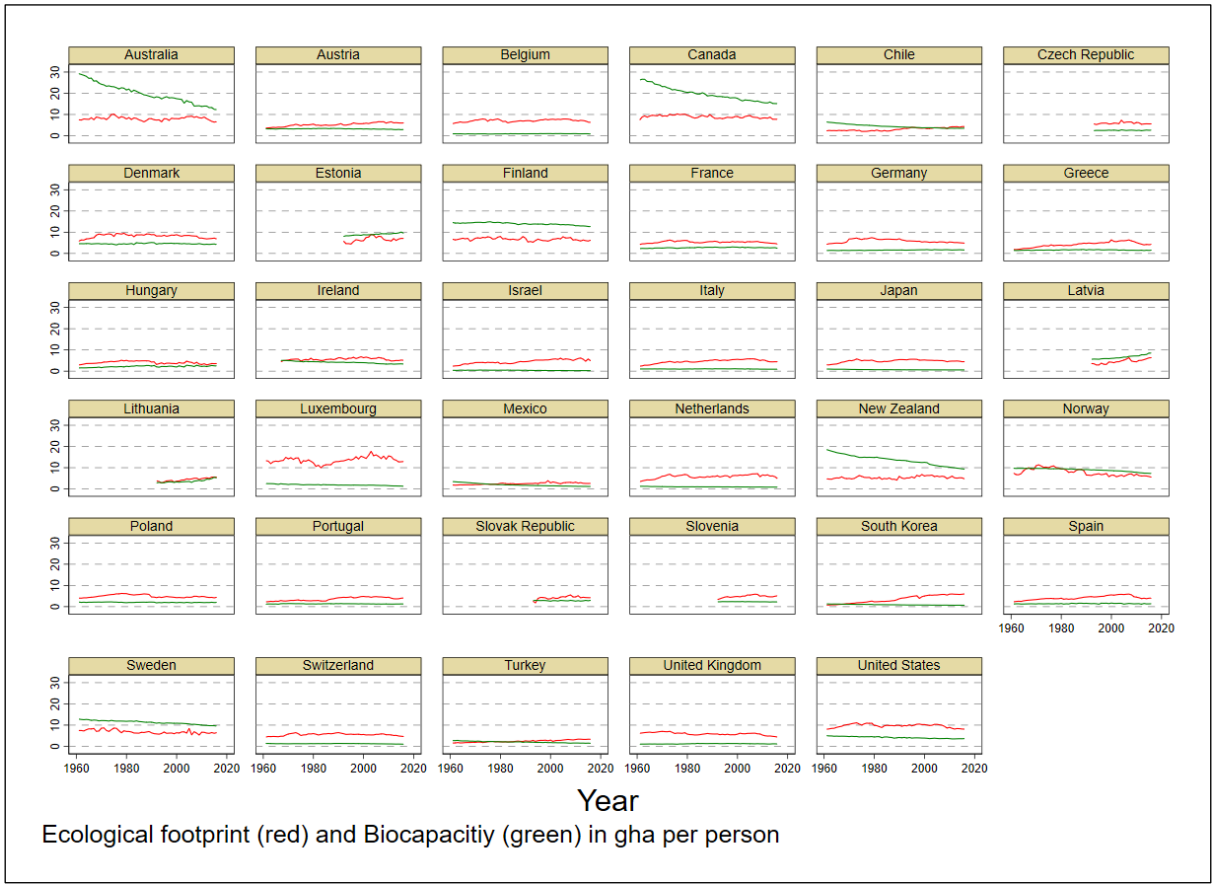
Specifically, this thesis adds insights to the scientific debate and especially to the research by Vanhuysse (2013) by offering additional snapshots with country comparisons over a period of twenty years (the original report focused on a snapshot at the end of the first decade of the 21st century), by showing trends in the four dimensions, comparing six cases on the different indicators and their demography, giving a wide moral assessment of the results, based on the different theories of justice, testing the claims whether health spending would increase the EBiSS values, and by pointing further research pathways.

Chapter 4 – Data Analysis

4.1 Environmental Dimension

I will start the analysis of the environmental dimension with a look at the long term trends in the ecological footprint and biocapacity per person, and later of the net footprint per person. This will constitute of a descriptive analysis of the absolute and percentage changes in the different indicators across the countries.

Figure 1 – Ecological Footprint and Biocapacity (global hectares per person)



Source: Author's graphical configuration of data from the Global Footprint Network (2019)

Figure 1 shows the development of the first two indicators from the 1960s until 2016. The red line shows the ecological footprint per person and the green line the biocapacity per person. If the red line is over the green line, it means that the consumption is higher than the country's ecosystem's ability to stomach that demand. This means that country has to either import an amount of resources, deplete their natural resources, or emit superfluous emissions into the atmosphere; or a combination of all three. The first trend that can be observed in the data is the decline in the biocapacity in a number of countries. The biggest declines in biocapacity per person from 1961 to 2016 are observed in Australia (from 29.22 to 12.28 gha/person), Canada (from 26.27 to 15.12 gha/person) and New Zealand (from 18.56 to 9.34 gha/person), showing humankind's negative on the environment, and a worrying trend of destruction of habits and soil. Other countries with a decline of more than one gha per person since the 1960s were Sweden, Chile, Norway, Mexico, Finland, Ireland, United States, Luxembourg, and Turkey. Most other countries are also seeing declines, albeit very small ones, but there are also some countries who managed to increase their biocapacity per person. Among them are Hungary, Germany, France and Greece with minor improvements since the 1960s and Latvia (+2.86 gha/person), Lithuania (+2.28) and Estonia (+1.01) with stronger improvements between 1995 and 2016.[13] However, population data also showed that both Latvia' and Lithuania' population shrank by around 21%

[13] Data for Estonia, Latvia and Lithuania only reached from the mid-1990s to 2016.

between 1995 and 2016, with Estonia seeing a population decrease of 8% in the same time period. A quick comparison between the population developments and the biocapacity per person in the rest of the data set shows that population growth, as could be expected, plays a big role in the decline of biocapacity person, but that there are also countries like France and Germany that could book increases even with positive population growth in the long run. Regarding the developments in the Baltic countries, it has to be remarked that out of the eight post-communist countries in the sample six increased their biocapacity per person. A similar overall pattern can be observed when looking at the percentage change in biocapacity per person. The largest 'losers' in the sample are Mexico, Australia, Luxembourg, New Zealand, South Korea, Turkey, Chile, Canada, Japan and Israel with losses ranging from 66% to 40%. The best performing countries in percentage change are Hungary and Germany for the long trend with gains of around 60% and 19% respectively, while Lithuania and Latvia have booked the largest gains between 1995 and 2016 with gains of 79% and 50% respectively.

Changes in the ecological footprint per person can also be observed in a number of countries. The top performers in absolute change (between 1961 and 2016) are Norway (-1.93 gha/person), the United Kingdom (-1.78), Sweden (-1.02), followed by Australia, Finland, and Luxemburg, who all managed to decrease their ecological footprint per person. It has to be noted though, that many countries first saw an increase in the ecological footprint per person towards the 1990s and then managed to bring down their footprint. Looking at the absolute change reveals that Norway, the United Kingdom, Sweden, Australia, and Finland all had larger declines when taking 1995 as a starting point. As a matter of fact, with 1995 as a starting point, more countries are booking stronger declines, such as the United States, Switzerland, Germany, Denmark, the Netherlands, and Japan who all managed to decrease their footprint by 1 gha/person. The fact that all of those countries either only booked a small decline or actually a strong increase, taking 1961 as the base year, shows that many countries were increasing their ecological footprint per person during much of the second half of the 20th century. The worst performers in absolute change in the ecological footprint per person between 1961 and 2016 are South Korea (+5.22 gha/person), as well as Israel, Austria, Greece, Italy, and Chile who all booked increases between 2.5 and 2 gha/person. All of these countries have been able to reverse the trend after the 1990s, but South Korea, Austria and Chile still increased their ecological footprint per person after 1995. The strongest absolute increase after 1995 can be observed in the Baltic states Latvia (+3.43 gha/person), Estonia (+ 2.64) and Lithuania (+2.29). The top and worst performers are nearly identical when looking at the percentage change instead of absolute changes.

A look at Figure 1 also reveals an interesting trend in both Greece and Spain. Both countries observed a visible decrease in the ecological footprint since the Great Recession. A look at the data shows that during the troublesome period from 2007 to 2014 with the Great Recession and the European debt crisis both countries saw the strongest absolute and percentage changes in the ecological footprint per

person in the sample. Spain saw a decline of 2.16 gha/person (equal to a decline of 36.4%) and Greece a decline of 2.12 gha/person (equal to a decline of 33.3%). This development fits into the literature linking the growth in the ecological footprint to GDP and economic activity (Teixido-Figueras and Duro 2015), as both countries were hit very hard by the two crises. While these two crises, and especially the Great Recession, also had an impact on other countries, most of those countries only saw a short decline in the ecological footprint per person, after which the values increased again.

Figure 2 – Net Footprint (global hectares per person)

Source: Author's graphical configuration of data from the Global Footprint Network (2019)

Figure 2 shows the developments in the net footprint per person (the ecological footprint per person minus the biocapacity per person). This measure shows whether countries are operating within their own ecological budget or not. In the long run, the overall trend is that of a growing net footprint when averaging the change in all countries between 1961 and 2016. Similar to the developments in the ecological footprint per person, this measure shows a more mixed picture when looking at the change between 1995 and 2016. Many countries have decreased their net footprint in this period, all the while booking a net increase over the longer time period, pointing to an increase towards the end of the 20th century followed by a change of course. Over the longer time period only the United Kingdom and Hungary were able to lower their net footprint per person, with a decline of 1.84 gha/person and 0.27 gha/person. The worst performers in absolute change between 1961 and 2016 were Australia (+16.1

gha/person), Canada (+11.5), New Zealand (+9.16), South Korea (+5.87), and Chile (+4.94), followed by Turkey, Mexico, Austria and Israel with increases between 3.05 and 2.7 gha/person.

During the shorter and more recent time period, 1995 to 2016, more countries were able to lower their net footprint per person and the biggest absolute declines were observed in the United States (-1.31 gha/person), the Netherlands (-1.28), Denmark (-1.13), Japan (-1.07) and Germany (-1.01), followed by the United Kingdom, Spain, Switzerland and Belgium. The worst performers, all still increasing their net footprint after 1995, were Australia, New Zealand, Canada, Estonia, South Korea, Turkey, and Sweden, with the increase in net footprint per person ranging from 4.3 to 1 gha/person.

An overall comparison of the mean net footprint per person over time shows the increase quite clearly.[14] The mean net footprint per person in 1961 was at -1.12 gha/person. Already in 1968 this average becomes positive and then increases over time, with a few temporary dips, often during times of economic crises, such as in the beginning of the 1980s and around 2008/09. The mean reached 1.31 gha/person in 1995 and 2.13 gha/person in 2005 and then started decreasing to 1.49 gha/person in 2015.

While it is important to consider the changes in the ecological footprint and biocapacity per person, it is also crucial to look at the actual levels in the different countries. The following paragraphs will look at three graphs showing the performance in net footprint per person for the years 1995, 2005 and 2015, followed by a graph of the ecological footprint per person in 2015. It is important to remark that Luxembourg has been left out of the following graphs on net footprint and ecological footprint per person due to its high value in both measures. The net footprint in Luxembourg is often around twice as high as that of the country with the second highest net footprint. Leaving it out gives the reader a better look at differences between the other countries.

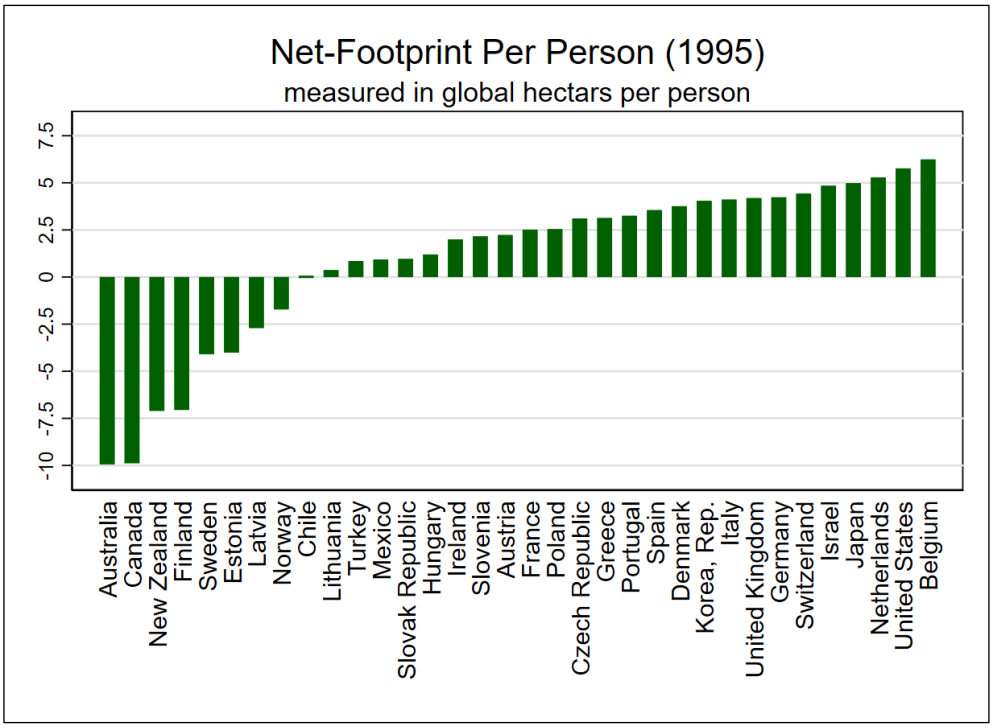
Figure 3 shows the net footprint per person for 1995. The best performers in this graph (meaning the countries with the lowest net footprint) are Australia and Canada (both with a net footprint of -9.9 gha/person), New Zealand and Finland (both with -7.1), Sweden and Estonia (both with about -4), followed by Latvia (-2.7) and Norway (-1.7). No other country in the sample had a negative net footprint in 1995. On the other side of the spectrum, Luxembourg stands out as the worst performer with a net footprint of 11.8 gha/person.[15] The second worst country is Belgium (6.2 gha/person), followed closely

[14] This is referring to the unweighted average between the countries in the sample. The reader therefore was to be aware that it does not take into account the size of the country and that all countries are weighted equally.

[15] See Figure 1 and 2 for the graph on Luxembourg's ecological footprint and net footprint per person.

by the United States, the Netherlands, Japan, and Israel. As mentioned above, the average in 1995 was 1.31 gha/person.

Figure 3 – Net footprint per person in 1995 (gha/person)



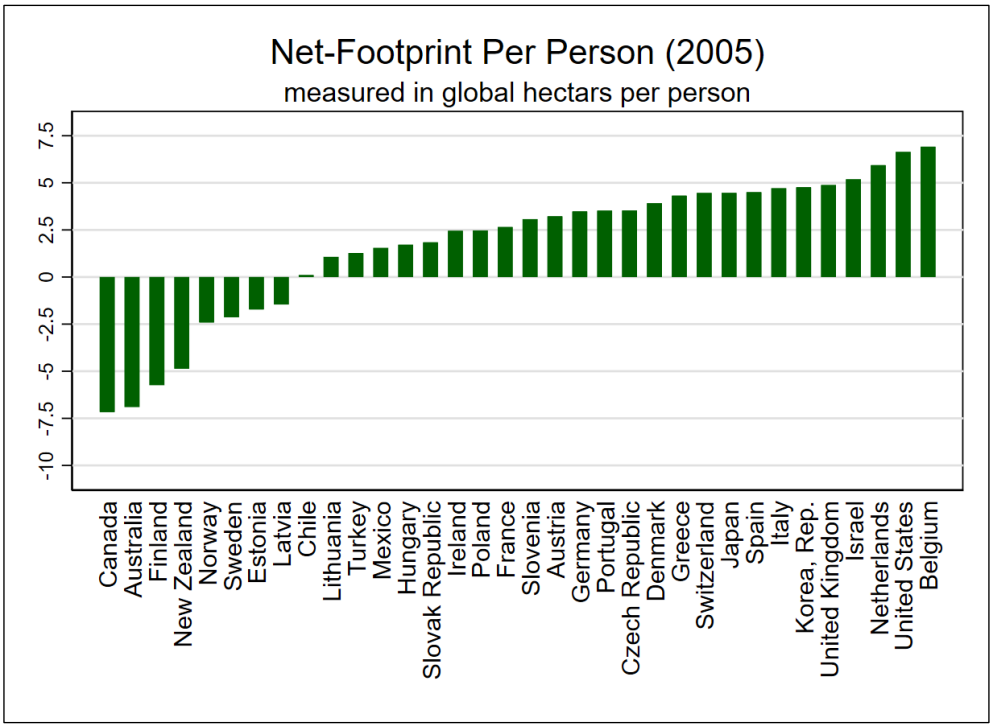
Source: Author's graphical configuration of data from the Global Footprint Network (2019)

Applying the different welfare regimes, we can see that the social democratic and the liberal welfare states are performing better on average than the conservative welfare states (with the liberal welfare states slightly outperforming the social democratic). Leaving out either Australia or Canada, however, significantly worsens the average for the liberal welfare states. Among the social democratic welfare states, Denmark is the exception as the only country with a positive net footprint per person.

The data for 2005, in Figure 4, shows an increased average net footprint, now at 2.13 gha/person. In most countries the net footprint increased, and this shows especially when we look at the eight countries with a negative footprint, who all saw increases, except for Norway which managed to lower its net footprint and move from eighth to fifth position. On the other end of the spectrum, Luxemburg (14.35 gha/person), Belgium (6.92), the United States (6.64), the Netherlands (5.94), Israel (5.19), and the United Kingdom (4.88) became the six worst performers in the sample, now with slightly worse net footprints per person. Only a handful of countries actually lowered their net footprint over these ten years, as for example Germany, Japan, Norway, and Poland, with Germany climbing from 28th to 20th position. All averages for the three welfare regimes worsened between 1995 and 2005, but now the social democratic welfare states (mean of -1.59 gha/person) are on average performing better than the liberal welfare states (-0.83 gha/person), followed at a far distance by the conservative

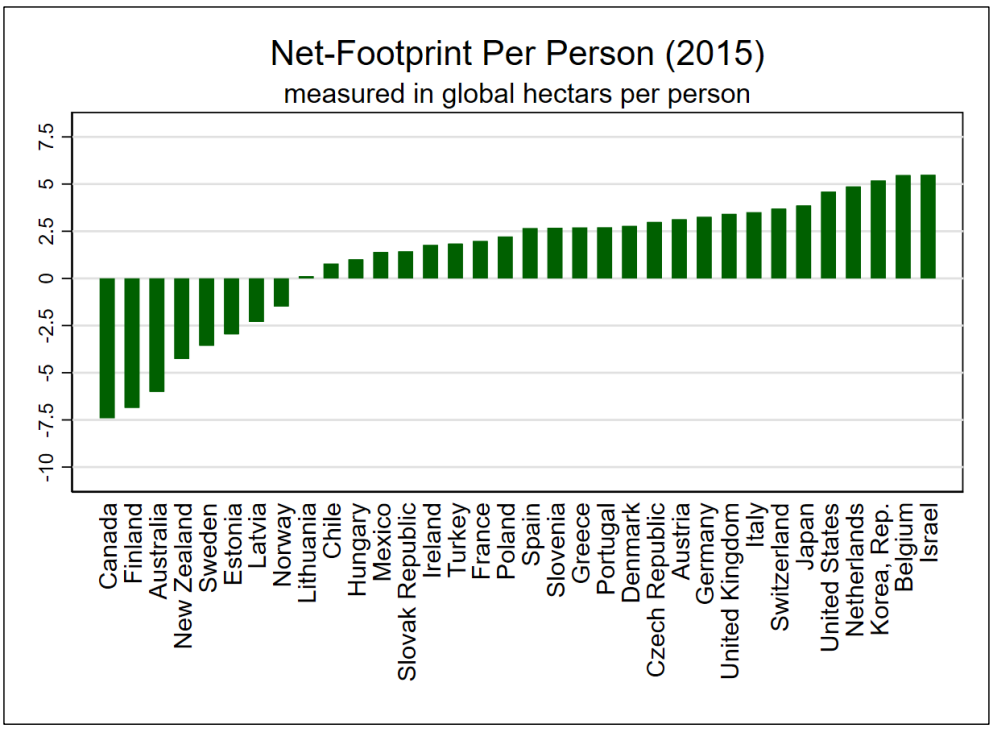
welfare states (4.37 gha/person). Again much of the value of the liberal welfare states depends on Australia and Canada with their low population density and vast landmass.

Figure 4 – Net footprint per person in 2005 (gha/person)



Source: Author's graphical configuration of data from the Global Footprint Network (2019)

Figure 5 – Net footprint per person in 2015 (gha/person)

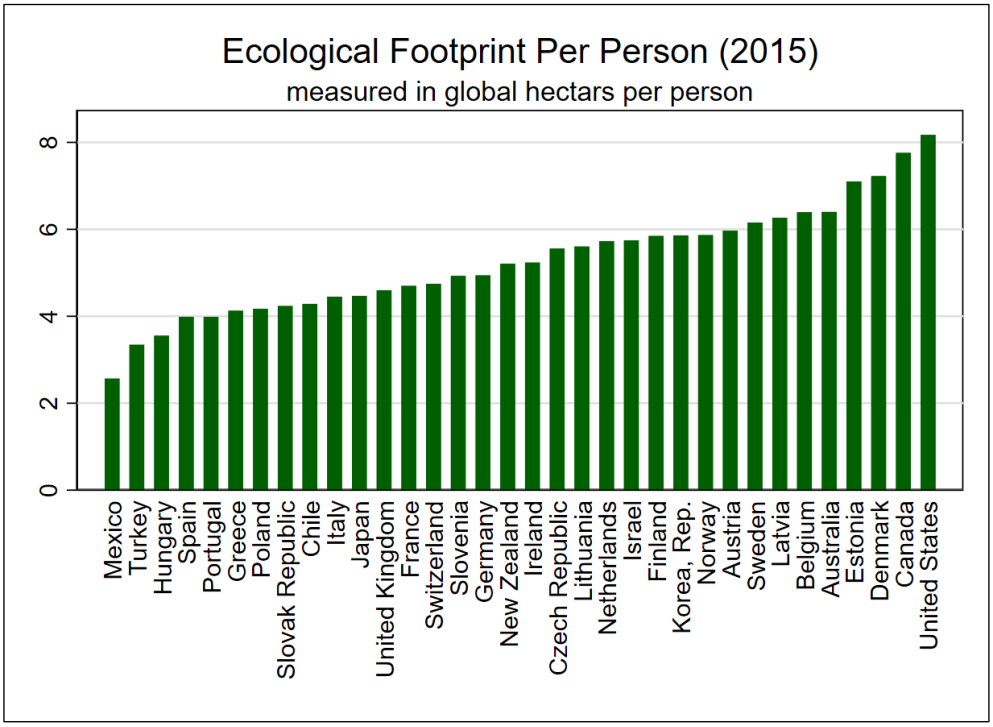


Source: Author's graphical configuration of data from the Global Footprint Network (2019)

The data for 2015 in Figure 5 shows the same eight countries with a negative net footprint per person, with minor changes. Since 2005, Canada, Finland, Sweden, Estonia, and Latvia lowered their net

footprint, while the other three followed their upward trend (meaning a less negative net footprint). The six worst performers are Luxembourg (11.46 gha/person), Israel (5.48), Belgium (5.47), the Republic of Korea (5.19), the Netherlands (4.87), and the United States (4.6). However, with the exception of Korea, they all improved their performance since 2005. This can also be said for the overall performance of the countries, as the average declined from 2.13 to 1.49 gha/person. Looking at the performance of the three welfare regimes in 2015, we can see that all three improved their average value since 2005, with the conservative regime even going below its 1995 average level. This leaves the social democratic welfare states at -2.28 gha/person, the liberal welfare states at -1.32 gha/person, and lastly the conservative welfare states at 3.4 gha/person.

Figure 6 – Ecological footprint per person in 2015 (gha/person)



Source: Author's graphical configuration of data from the Global Footprint Network (2019)

The net footprint is discussed in more detail here than the ecological footprint because it will in the end be one of the four indicators in the joint indicator IJI. However, it can offer some insights to compare the country performance for the ecological footprint per person in 2015. Figure 6 shows the ecological footprint per person in 2015. Mexico has the lowest ecological footprint with 2.57 gha/person, followed by Turkey (3.34 gha/person), Hungary (3.55), Spain (3.98) and Portugal (3.99). Luxembourg is still the worst performer (with 12.81 gha/person), with a large distant to the United States (8.17) in second place. The US is followed by Canada (7.76), Denmark (7.22) and Estonia (7.10). In general it can be stated that the countries from the social democratic and liberal welfare states that were performing particularly well on the net footprint measure, all have relatively high ecological footprints per person, as Canada, Australia, Norway, Finland and Sweden are all in the upper half of

the sample, with the lowest value out of these five countries found in Finland (5.85 gha/person), slightly above the average of 5.49 gha/person.

Concluding on the trends and levels observed here, we can make a number of conclusions. Firstly, on average the OECD countries observed a fall in the biocapacity per person since the early 1960s. Secondly, there are some countries that increased their biocapacity since the early 1960s (e.g. Germany and Hungary), and since 1995 (Estonia, Latvia, and Lithuania). Thirdly, most countries saw an increase in the ecological footprint per capita towards the end of the last century and some countries began lowering their ecological footprint per person up to 2015. And fourth, the net footprint per person in most countries was increasing until the end of the 20th century and then began to decline slightly towards 2015. And fifth, the net footprint on average is positive in the OECD countries and this means that they are consuming more than their country can compensate. And lastly, the countries performing best (in the net footprint measure) are Canada, Australia, New Zealand, Estonia, Latvia, and the Nordics (except for Denmark), while the countries performing worst are Luxembourg, Israel, Belgium, the Republic of Korea, the Netherlands, and the United States.

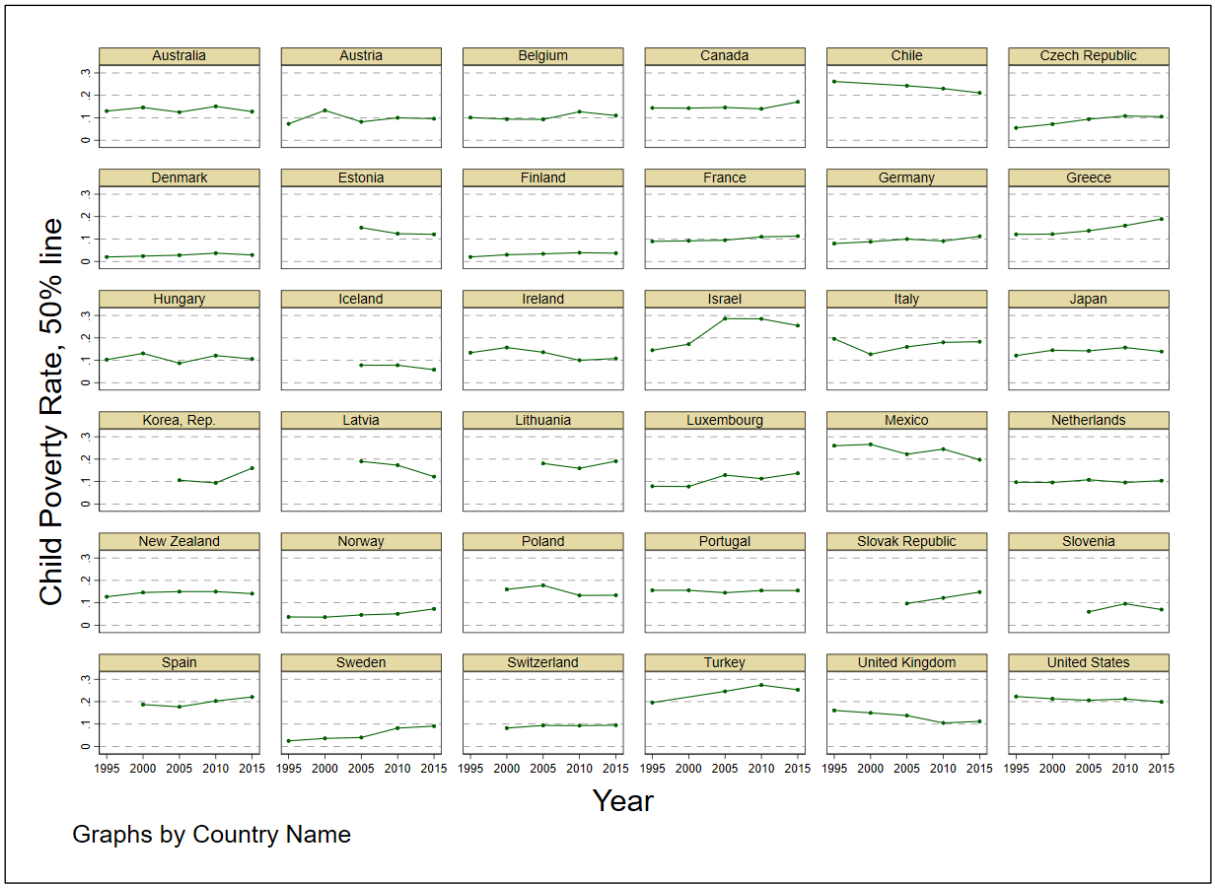
4.2 Social Dimension

This part contains an analysis of the developments of child poverty, measured as the share of the population under 18 for which the household income is below the poverty line of 50% of median household income.

Figure 7 shows the development of child poverty over the period of twenty years between 1995 and 2015. This indicator as opposed to the environmental indicators shows a wide variety of developments. The scale is given as the share of population in decimal values, meaning that a child poverty rate of 10% is represented with a value at 0.1 in the graphs. We can see countries who were able to lower the child poverty rate continuously over the observatory period like Chile, Estonia, Iceland, and Latvia. Then there is a range of European countries that, mostly starting off from low levels below 10%, saw an increase in their child poverty rate over the observatory period, counting Austria, Czech Republic, Denmark, Finland, France, Germany, Luxembourg, Norway, Sweden, and Switzerland. Other countries like Australia, the Netherlands, Hungary, and Portugal observed ups and downs with only minor changes in the child poverty rate, comparing their value in 1995 and 2015. However, there are also countries that saw stronger changes, such as Israel (from 17.2% in 2000 to 28.6% in 2005) or the Republic of Korea with 9.4% in 2010 to 16% in 2015. We can also observe a strong fall in Italy between 1995 and 2000 (from 19.6% to 12.7%), after which the child poverty rate began climbing up again nearly to its starting level. Mexico also observed strong ups and downs but managed to lower the rate

overall. Interesting is also the development in the United Kingdom which managed to lower its child poverty rate from 1995 to 2010, but then saw a minor increase towards 2015.

Figure 7 – Child Poverty Rate (50% line)



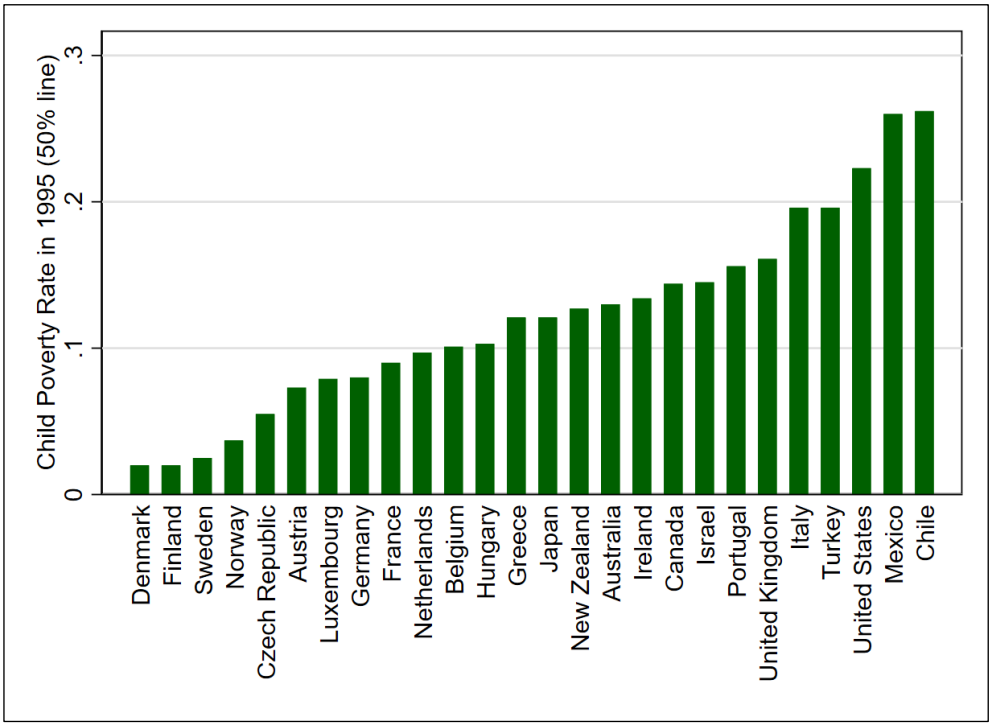
Source: Author's graphical configuration of data from the OECD Statistics Income Distribution Database (2020)

A last remark on the trends in child poverty rates can be made about the averages in the different years. While one should be careful to compare the averages for the years 1995 and 2000 with the later years, one can make observations about the averages between 2005 and 2015.[16] The average in 2005 was 13.14%, then it increased to 13.6% in 2010 and decreased only slightly to 13.54% in 2015. The averages in 1995 and 2000 were 12.14% and 12.16% respectively, but as mentioned above, one should be careful to interpret too much into those values. For those 26 countries for which data is available for 1995 and 2015, the best developments, meaning the biggest falls in percentage points, were observed in Mexico (-6.25 percentage points), Chile (-5.1), the United Kingdom (-4.9), Ireland (-2.6), and the United States (-2.4). The worst developments, meaning the strongest rises in percentage points, were observed in Israel (+11 percentage points), followed by Greece (+6.8), Sweden (+6.6), Luxembourg (+5.8), Turkey (+5.7), and the Czech Republic (+5).

[16] While the number of countries in the dataset is 26 in 1995 and 27 in 2000, the data set is complete (with 36 countries) for 2005, 2010, and 2015.

Figure 8 shows the child poverty rates in 1995. The best performing countries are Denmark and Finland (both with a child poverty rate of 2%), followed by Sweden (2.5%), Norway (3.7%), the Czech Republic (5.5%) and Austria (7.3%). The worst performing countries are Chile (26.2%), Mexico (26%), the United States (22.3%), Turkey (19.6%) and Italy (19.6%). Looking at the three welfare regimes described in chapter 3, we can see large differences in performance. While the social democratic regime on average has a child poverty rate of 2.55%, both the liberal and the conservative regime are far above. The average in the former is the highest with 15.32%, while the average in the latter with 11.43% is still far above the average in the social democratic regime.

Figure 8 – Child Poverty in 1995



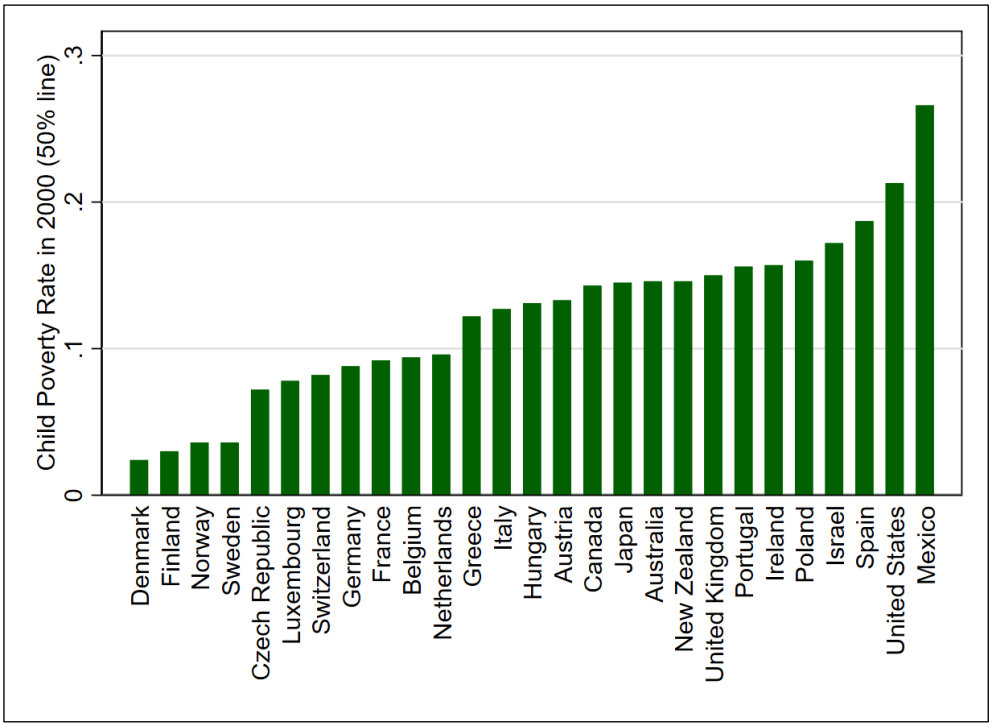
Source: Author's graphical configuration of data from the OECD Statistics Income Distribution Database (2020)

I want to allow for a short digression here and show that this data aligns with a different statistic on poverty before and after taxes and transfers, from Kersbergen and Vis (2014). The authors show that the reduction in poverty for families with children through taxes and transfers is not equally effective in all three welfare regimes (see Table A.1 in the Appendix). While this statistic is not entirely the same as the child poverty indicator, there are some similarities.

We can then also see some similarities in the data, showing that the average post taxes and transfers poverty rate for the social democratic regime is the lowest out of the three regimes and that the liberal regime has the highest average. The authors first show that the differences between the regimes were barely existent for market poverty, but reductions in poverty achieved through the state are comparatively large. This rate of reduction is by far the highest for the social democratic regime (84%), followed by the conservative regime (66%) and later the liberal regime (40%). The authors also present

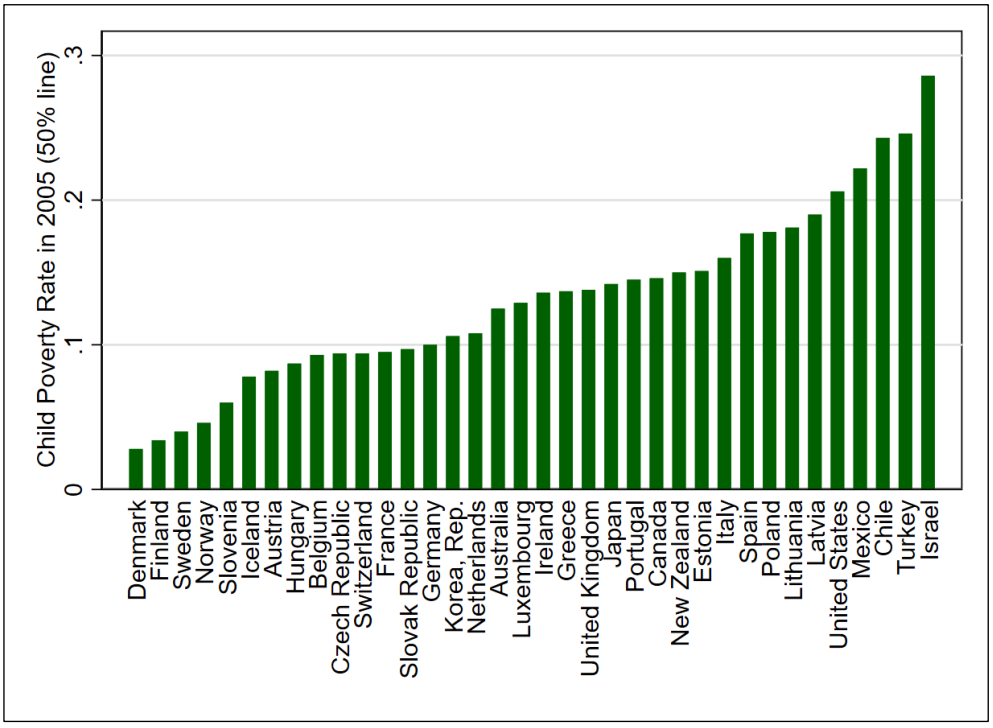
in their work a statistic on poverty reduction specifically for mothers (84.5%) and for single mothers (87.7%), confirming the results in table A.1, that the social democratic regime is performing best in reducing market poverty (Kersbergen and Vis 2014, 94).

Figure 9 – Child Poverty in 2000



Source: Author's graphical configuration of data from the OECD Statistics Income Distribution Database (2020)

Figure 10 – Child Poverty in 2005



Source: Author's graphical configuration of data from the OECD Statistics Income Distribution Database (2020)

Figure 9 shows the child poverty rates for 2000. The best performing countries are again Denmark (2.4%), Finland (3%), Sweden and Norway (both 3.6%), Czech Republic (7.2%) and Luxembourg (7.8%). It is remarkable, though, that four out of those six countries have a higher child poverty rate than in 1995 and that Norway and Luxembourg who have a lower child poverty rate than before only managed to lower it by 0.1 percentage points each. Austria, which in 1995 held the position as sixth best country, since saw its child poverty rate rise significantly from 7.3% to 13.3%. The worst performing countries in the sample for 2000 are Mexico (28.6%), the United States (21.3%), Spain (18.7%), Israel (17.2%), and Poland (16%). The small increases in the child poverty rates in the Scandinavian countries also show in the average for the social democratic regime, which is at 3.15% in 2000. The average also slightly increased for the conservative regime which had an average of 11.77% in 2000, as well as for the liberal regime where the average increased to 15.92%.

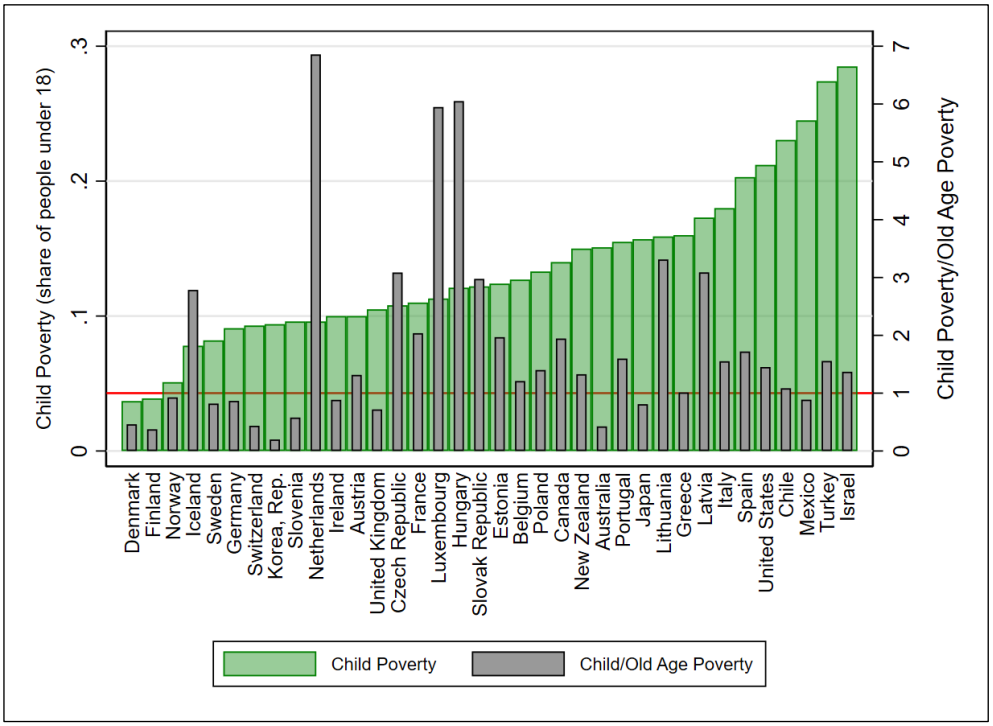
Figure 10 shows the child poverty rates for 2005. The best performing countries are Denmark (2.8%), Finland (3.4%), Sweden (4%), Norway (4.6%) and Slovenia (6%). The first four countries all saw their child poverty rate increase since 2000. Luxembourg, which held the position as sixth best in 2000 saw a significant rise in child poverty rate from 7.8% in 2000 to 12.9% in 2005. The worst performing country is Israel with a particular strong rise from 17.2% in 2000 to 28.6% in 2005. Israel is followed by Turkey (24.6%), Chile (24.3%), Mexico (22.2%), and the United States (20.6%). The average in 2005, as mentioned above, lies at 13.14%. The only regime above this average is the liberal welfare regime with an average of 15.02%. The lowest average can be found in the social democratic regime (3.7%), followed by the conservative regime (11.91%).

Figure 11 and 12 contain additional information compared to the previous graphs. In addition to the child poverty rates (in green), we can also see a ratio of the child poverty over the old age poverty (in grey). This measure was employed by Vanhuysse (2013) to compare how the poverty of children compared to the poverty of the elderly generations (people over 65 years). It was argued by Vanhuysse that countries with a particularly high value of child over old age poverty ratio have to face additional scrutiny regarding intergenerational justice. It is appropriate to start with a description of the new graph format. The values for child poverty are found on the y axis on the left and the values for the child over old age poverty ratio are found on the right y axis. If a country has a value of two for its grey indicator, its child poverty rate is twice as high as the old age poverty rate.

In 2010 the best performing countries on the child poverty indicator were Denmark (3.7%), Finland (3.9%), Norway (5.1%), Iceland (7.8%), Sweden (8.2%), and Germany (9.1%). Except for Iceland and Germany, all top performers have increased child poverty rates compared to 2005, but the increase is the highest for Sweden which jumped from 4% in 2005 to 8.2% in 2010. The worst performers are Israel (28.5%), Turkey (27.4%), Mexico (24.5%), Chile (23.05%), the United States (21.2%) and Spain,

which saw a rise from 17.7% in 2005 to 20.3% in 2010. The average in 2010 has increased to 13.6%. An increase could also be observed in the average for the social democratic regime which increased to 5.23% in 2010. The average of the conservative regime also increased, namely to 13.15%, while the liberal regime saw its average decrease to 14.3%.

Figure 11 – Child Poverty Rate and Child/Old Age Poverty Rate in 2010



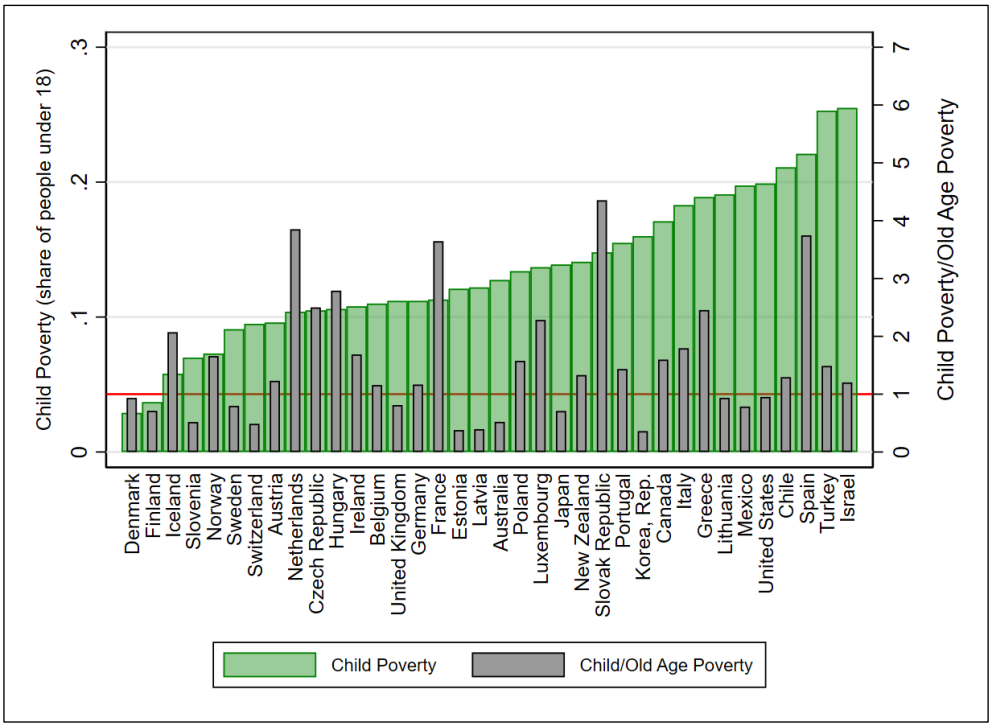
Source: Author's computation and graphical configuration of data from the OECD Statistics Income Distribution Database (2020)

Figure 11 also shows that many countries have a child to old age poverty that is higher than 1 (visible in the graph as crossing the red horizontal line). The highest values for the ratio of child over old age poverty can be found in the Netherlands (6.86), Hungary (6.05), Luxembourg (5.95), Lithuania (3.31), Latvia (3.09), the Czech Republic (3.09). Very low values of below 0.5 can be found in the Republic of Korea, Finland, Australia, Switzerland, and Denmark.

Figure 12 shows the child poverty rates and the ratio of child over old age poverty for 2015. The best performing countries in child poverty were Denmark (2.9%), Finland (3.7%), Iceland (5.8%), Slovenia (7%), Norway (7.3%), and Sweden (9.1%). The worst performing countries are Israel (25.5%), Turkey (25.3%), Spain (22.1%), Chile (21.1%), the United States (19.9%), and Mexico (19.75%). While the other five countries out of those six all saw a fall in their child poverty rate, Spain saw an increase up from 20.3% in 2010, after the previous increase from 17.7% in 2005. All three regimes saw small increases compared to 2015. The lowest average is found in the social democratic regime (5.75%), followed by the conservative regime (13.78%), and the liberal regime (14.31%). While the social democratic regime remained the regime with the lowest value, with a great distance to the other two, the conservative

and liberal regime in 2015 were only separated by 0.53 percentage points compared to 3.89 percentage points in 1995.

Figure 12 – Child Poverty Rate and Child/Old Age Poverty Rate in 2015



Source: Author's computation and graphical configuration of data from the OECD Statistics Income Distribution Database (2020)

The child over old age poverty ratios are lower in 2015, with the highest value found in the Slovak Republic (over 4), the Netherlands, Spain, and France (all between 3 and 4), as well as the Czech Republic and Hungary (between 2 and 3). Especially the high values of France and Spain are remarkable though, as they represent a strong increase since 2010.

Concluding on the trends and levels observed here, we can make a number of conclusions. Firstly, child poverty rates overall slightly increased during the observational period. Secondly, the developments are very varied and not particularly uniform across the sample, most EU countries in the sample saw increases in child poverty rates. Thirdly, worrisome developments are for example observed in Israel with a drastic increase in child poverty between 2005 and 2010 and Spain with a continuously high level of child poverty and a strong increase after 2005. And lastly, the countries of the social democratic regime, without exception, performed best compared to the other regimes over the observatory period, while the averages of the conservative and liberal regime (the latter having the higher average) converged towards the end of the observational period. This aligns with the social democratic regimes superior performance in poverty reduction through taxes and transfers.

4.3 Economic and Fiscal Dimension

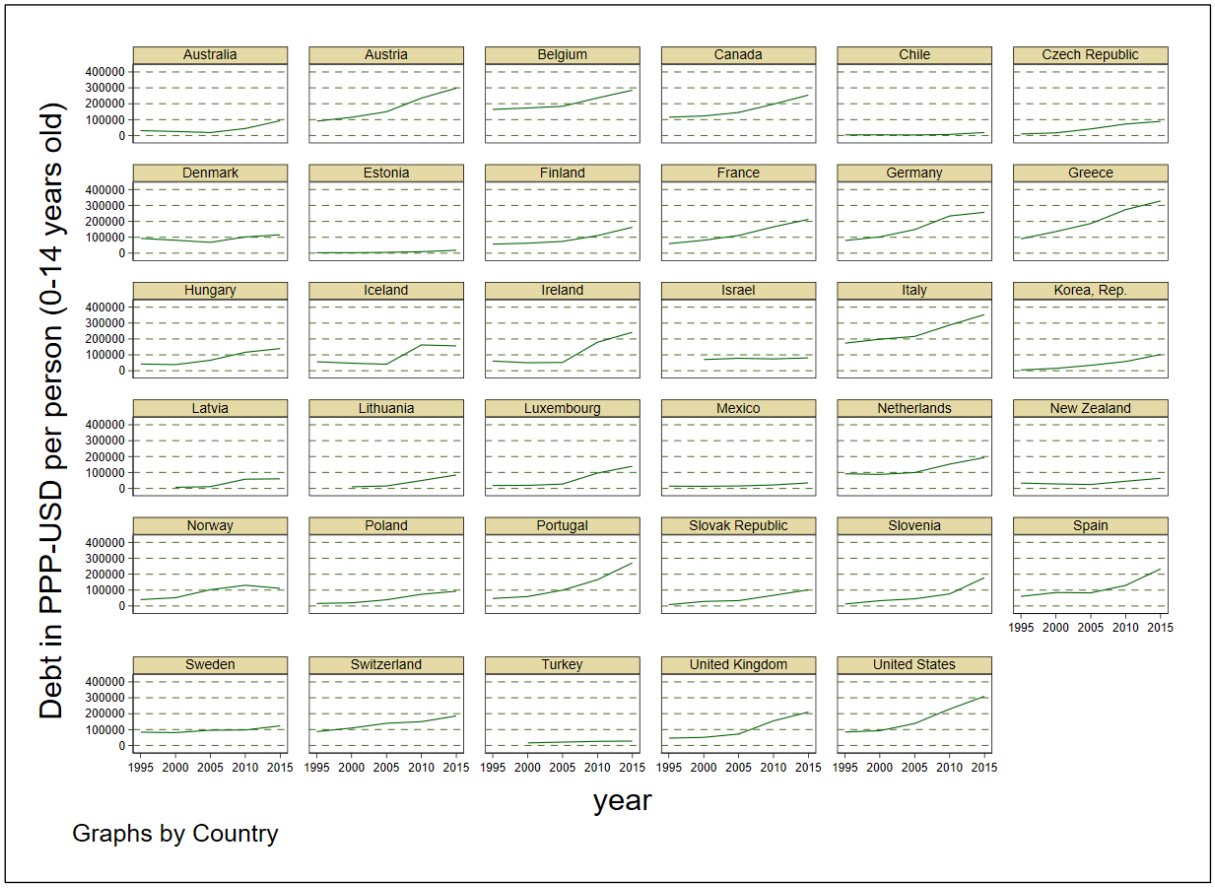
For this third dimensions, I used, the general government gross debt divided by the number of people between 0 and 14 years old. The data is presented as the level of debt in purchasing power parities US Dollars per child (people 0 to 14 years old).

Figure 13 shows the development of debt per child between 1995 and 2015. Figure 14 shows the same for Japan, which was excluded from the main graph because its value goes up drastically towards 2015 and would make a comparison between the other countries harder. The first thing that becomes apparent is that all countries observed increases in the ratio of debt per child. Many countries observed a particularly strong increase between the years 2005 and 2010, as can be observed for example in Austria, Germany, Greece, Iceland, Ireland, Italy, Latvia, Luxembourg, the United Kingdom, and the United States

On average the debt per child increased by 130,650.3 PPPUSD/child between 1995 and 2015.[17] The worst performer, in the increase of debt per child, was Japan (+581,930.2 PPPUSD/child). Figure 14 shows how the country increased its debt per child ratio from 138,179 PPPUSD/child to 720,110 PPPUSD/child in 2015. To put this into perspective we can remark that already in 2005 Japan went beyond the scale of all the countries represented in Figure 13, namely 400,000 PPPUSD/child, and then in 2015 still had a debt ratio twice as big as in the country with the second highest ratio, Italy. In terms of increases in debt per child, Japan was followed by Greece (+238,522.6 PPPUSD/child), the United States (+224,658.5 PPPUSD/child), Portugal (+224,140.6 PPPUSD/child), Austria (+207,562.5), as well as Ireland, Italy, Germany, and Spain (with an increases between 170,000 and 180,000 PPPUSD/child). The worst increases in percentages were found in the Republic of Korea (debt per child grew by 1,886%), followed by Slovenia (1,327%), the Slovak Republic (1,135%), the Czech Republic (785%), Luxembourg (659%) and Estonia (556%). Lithuania and Latvia also observed a strong increase between 2000 and 2015, with debt per child growing by 751% and 810% respectively. The average growth was at 376% between 1995 and 2015.

[17] This development excludes Turkey, Latvia, Lithuania, and Israel, since there is no data for those countries for 1995 in the data set.

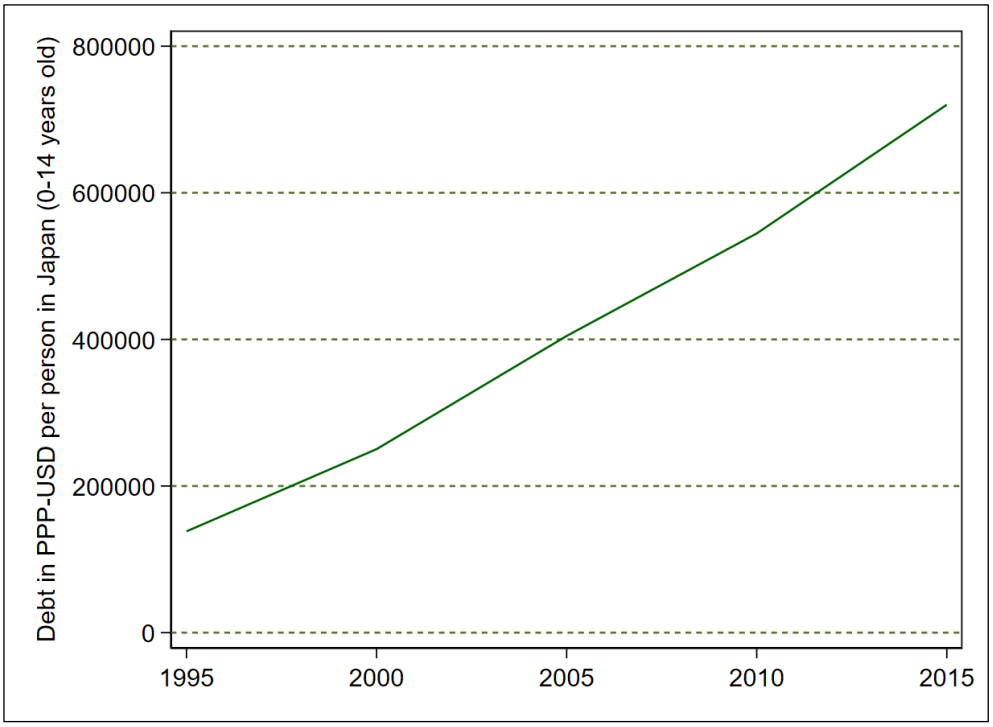
Figure 13 – Debt per child (PPP US Dollars per person 0-14 years old)



Source: Author's own computation and graphical configuration based on debt data from the World Bank (2019g), PPP conversion rates from the OECD (2020d), and population data from the World Bank (2019e)

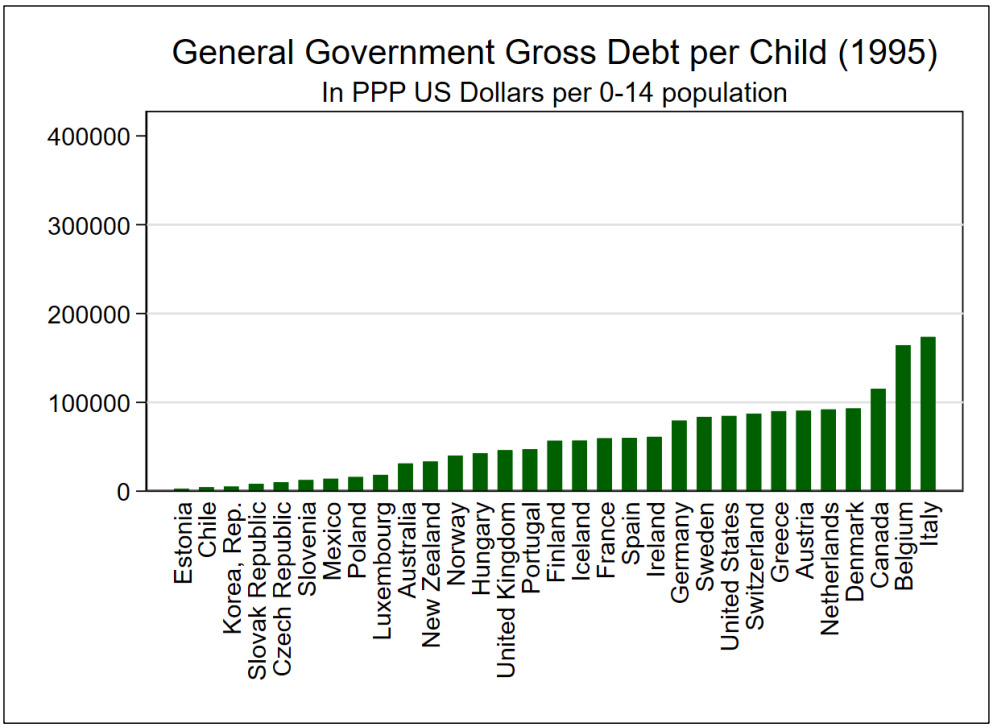
The best performing countries in the development of debt per child in PPPUSD/child, with the lowest changes, are Chile (with an increase of 14,658.64 PPPUSD/child), Estonia (+15,126.76), Mexico (+20,992.85), Denmark (+22,693.68), New Zealand (+30,229.78), Sweden (+40,104.81), Australia (+62,303.63) and Norway (+70,675.92). Israel and Turkey, for which there is no data for 1995 saw the lowest increase in debt per child for the period 2000 to 2015, with an increase of 10,618.3 PPPUSD/child and 11518.2 PPPUSD/child respectively. The lowest growth in debt per child between 1995 and 2015 in percentage terms was observed in Denmark (debt per child grew by 24.37%), Sweden (47.95%), Belgium (73.61%), New Zealand (90.66%) and Italy (103.48%).

Figure 14 – Debt per child in Japan (PPP US Dollars per person 0-14 years old)



Source: Author's own computation and graphical configuration based on debt data from the World Bank (2019g), PPP conversion rates from the OECD (2020d), and population data from the World Bank (2019e)

Figure 15 – Debt per Child in 1995

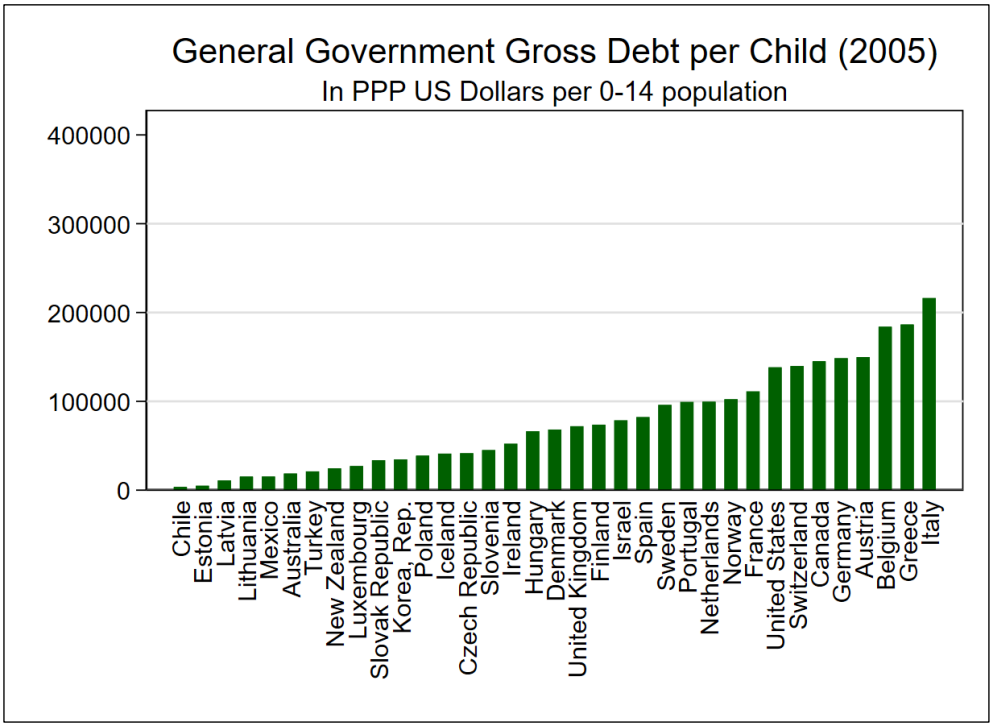


Source: Author's own computation and graphical configuration based on debt data from the World Bank (2019g), PPP conversion rates from the OECD (2020d), and population data from the World Bank (2019e)

Figure 15 shows the debt per child levels in 1995. The worst performers with the highest debt per child ratio are Italy, Belgium, Japan, and Canada, with values between 100,000 and 175,000 PPPUSD/child. The best performing countries were Estonia, Chile, Republic of Korea, and Slovak Republic all with

values under 10,000 PPPUSD/child. The mean in that year was around 60,000 PPPUSD/child and all three welfare regimes are on average over that mean. The lowest value is found in the liberal regime (61,955 PPPUSD/child), followed by the social democratic regime (68,383 PPPUSD/child) and the conservative regime with a higher value of 94,407 PPPUSD/child.

Figure 16 – Debt per Child in 2005



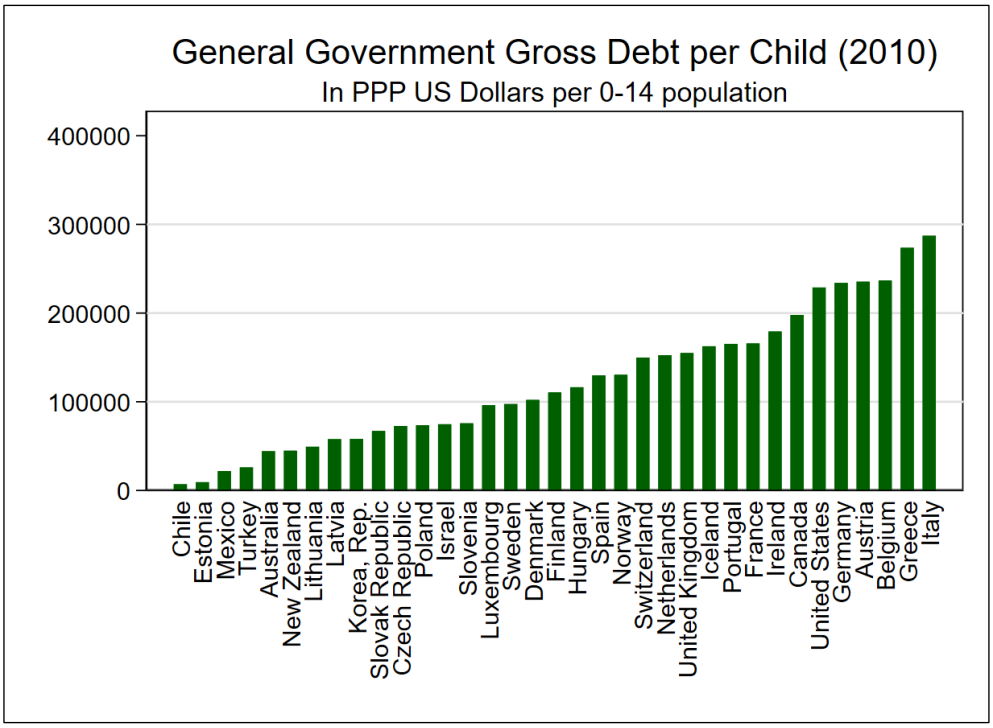
Source: Author's own computation and graphical configuration based on debt data from the World Bank (2019g), PPP conversion rates from the OECD (2020d), and population data from the World Bank (2019e)

Figure 16 shows debt per child for 2005. The lowest values are found in Chile and Estonia with values below 5,000 PPPUSD/child, followed by Latvia, Lithuania, Mexico, and Australia, with values between 10,000 and 20,000 PPPUSD/child. The country with the highest debt per child ratio is now Japan, a development that could also be observed in Japan's graph in Figure 14, with a steep incline. In 2005 the country already reached a debt per child ratio of 400,000 PPPUSD/child, nearly twice as high as the country with the second highest value. Japan is followed by Italy (216,243.9 PPPUSD/child), Greece and Belgium (both at around 185,000 PPPUSD/child), as well as Austria, Germany, and Canada (all with slightly under 150,000 PPPUSD/child). We can see in the comparison between Figures 15 and 16 how, for example, Germany, Greece and Japan worsened their relative positions in the sample.

The mean value in the sample increased from around 60,000 PPPUSD/child (over around 66,000 PPPUSD/child in 2000) to about 86,000 PPPUSD/child in 2005. The average of the liberal regime did not much increase between 1995 and 2000 but rose to 75,114 PPPUSD/child in 2005. The same goes for the average of the social democratic regime which did not increase significantly between 1995 and 2000 but rose to slightly below the overall average in 2005, with a value of 85,048 PPPUSD/child. The

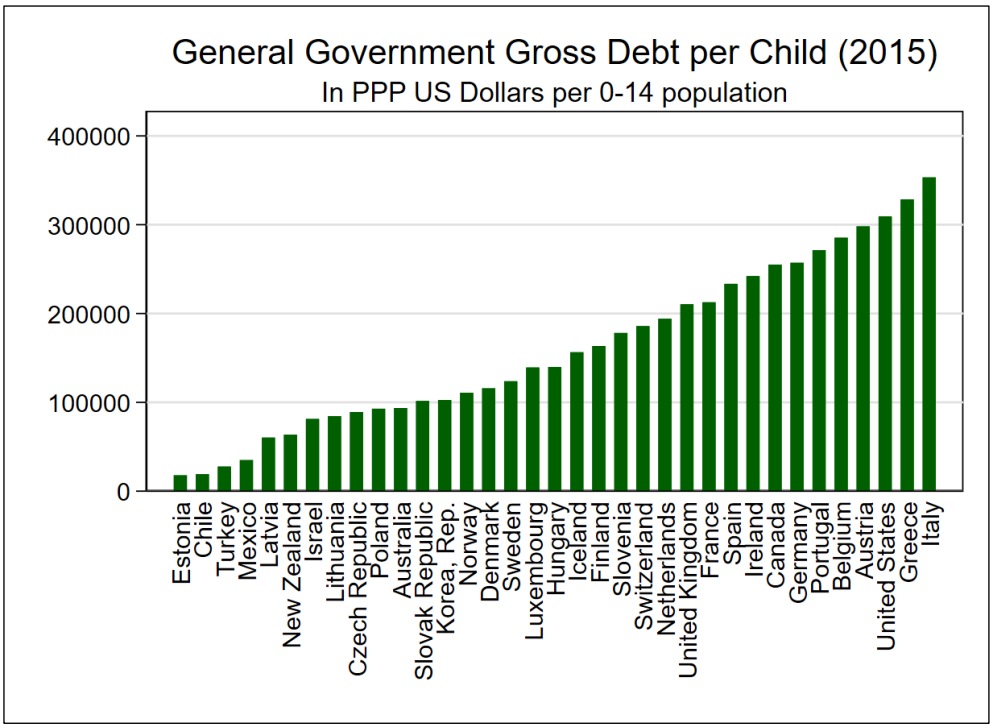
conservative regime still has the highest average value and with 141,697 PPPUSD/child stands a lot higher than the overall mean.

Figure 17 – Debt per Child in 2010



Source: Author's own computation and graphical configuration based on debt data from the World Bank (2019g), PPP conversion rates from the OECD (2020d), and population data from the World Bank (2019e)

Figure 18 – Debt per Child in 2015



Source: Author's own computation and graphical configuration based on debt data from the World Bank (2019g), PPP conversion rates from the OECD (2020d), and population data from the World Bank (2019e)

Figure 17 shows the debt per child ratios in 2010. Chile and Estonia still have the lowest values in the sample with a ratio below 10,000 PPPUSD/child, followed by Mexico, Turkey, Australia, New Zealand, and Lithuania with values below 50,000 PPPUSD/child. The highest value is again found in Japan, which now holds a debt per child ratio of 544,531.7 PPPUSD/child. Japan is followed by Italy, Greece, Belgium, Austria, Germany, and the United States with values between 200,000 and 300,000 PPPUSD/child.

Many countries observed a strong increase between 2005 and 2010, which is also represented in the increase of the overall mean debt per child ratio, which rose to 134,260.3 PPPUSD/child in 2010. While the mean was rising throughout the whole observational period, the increase between 2005 and 2010 was the highest, both in terms of absolute change (a rise of 48,410 PPPUSD/child) and in percentage change (growth of 56.39%). This increase was the fastest in Latvia (growth of over 400%), followed by Lithuania, Ireland, Luxembourg, and Iceland (all with a growth of over 200%). For Ireland this also meant a drastic change in its relative position in the sample, from the twenty first value to the ninth highest value. The changes between 2005 and 2010 also changed the positions between the different welfare state regimes. The social democratic regime now holds an average of 110,135.1 PPPUSD/child, the only one of the three regimes below the overall mean. The liberal regime is at 141,676 PPPUSD/child and the conservative regime is at 203,010.3 PPPUSD/child.

Figure 18 shows the debt per child ratios in 2015. Compared to 2010 not too many changes have taken place in the positioning of the countries at the top and bottom end of the spread. However, in comparison with Figure 15, showing the debt per child ratios for 1995, we can see the strong overall increase in debt per child across the sample over the observational period. The lowest values are found in Estonia, Chile, Turkey, Mexico, Latvia, and New Zealand, with values between 17,000 and 63,000 PPPUSD/child. The countries with the highest debt per child ratios are Japan, Italy, Greece, the United States, Austria, Belgium, and Portugal. Both the United States and Portugal are now in a worse position relative to the other countries, compared to the two decades before that.

As mentioned before, the overall mean increased in all time periods and in 2015 reached a level of 176,464.8 PPPUSD/child. This again leaves only the social democratic regime's average below the overall mean, with an average of 128,409.3 PPPUSD/child. The liberal regime is second with 195,686.7 PPPUSD/child and the conservative regime has the highest average with 261,994.5 PPPUSD/child.

Concluding on the trends and levels observed here, we can make a number of remarks. Firstly, the ratio of debt per child increased across the board between 1995 and 2015, with a particularly strong increase between 2005 and 2010. Secondly, we have seen very strong increases in a number of countries, above all in Japan, Greece, the United States, Portugal and Austria. Thirdly, since at least 2005, Japan is the extreme outlier with a debt per child ratio around twice as high as that of the country

with the second highest value since 2005, Italy. And lastly, the very strong increases in debt per child, between 2005 and 2010, but also between 2010 and 2015, happened during a period in which the world was hit by a devastating economic crisis, the Great Recession. In Europe, this was followed by a wave of austerity and a few years later by the European debt crisis.

4.4 Elderly Bias in Social Spending

I want to start the analysis of this indicator with a digression on health spending. As in the study by Vanhuysse (2013), health spending was not included in the EBiSS indicator. This is due to the lack of data on age-specific health spending. However, there are some countries for which this data is available.[18] I will therefore analyse the data on its impact on the EBiSS indicator to check whether including it would change the bias. It is especially valuable to test the prediction made by Vanhuysse, that leaving out health spending would lead to an EBiSS that "almost certainly underestimates the pro-elderly bias of welfare spending" (Vanhuysse 2013, 28). Including the health spending data into the data set had a different effect for all four countries.

Table 1 shows that including health spending decreased the EBiSS in the Czech Republic by 17%, increased it in the Republic of Korea by 9.17%, decreased it in Germany by 9.59% and had only a small effect on the EBiSS in the Netherlands with a 2.34% decrease in 2005 and a 1.81% increase in 2010. A negative change means that the spending ratio (spending for elderly over spending for non-elderly) for health spending was lower than the spending ratio for the rest of social spending, and vice versa for a positive change in the EBiSS.

Table 1 – The Impact of Health Spending on the EBiSS

	CZECH REPUBLIC	**REPUBLIC OF KOREA**	**THE NETHERLANDS**		**GERMANY**
YEAR	**2010**	**2010**	**2005**	**2010**	**2005**
EBISS	6,48	3,29	4,22	3,79	5,14
EBISS INCL. HEALTH SPENDING	5,37	3,59	4,12	3,86	4,64
PERCENTAGE CHANGE IN THE EBISS	-17.08%	9.17%	-2.34%	1.81%	-9.59%

Source: Author's own computation and configuration based on social spending data from the OECD SOCX database (2019), health spending data (Gesundheitsberichterstattung des Bundes 2020; OECD Statistics), education spending data (National Center for Education Statistics 2018b; World Bank 2019b), population data (World Bank 2019d) and exchange rate data (OECD 2020a)

[18] In order to match the available age-specific health data to social spending data, I made the assumption that health spending in those countries would not vary much from one year to the other. This makes it possible to use spending data for 2009 (Czech Republic and Republic of Korea) and 2011 (The Netherlands) to compare with social spending data for 2010, as well as spending data from 2004 and 2006 (Germany) to compare with social spending data for 2005

A look at the health spending ratio also reveals large differences among countries. The *health spending ratio* in Table 2 shows the ratio of total health expenditure on elderly people over total health expenditure on non-elderly people. This is then multiplied by the ratio of non-elderly people over elderly people (*non-elderly to elderly ratio*, short NEE ratio), in order to obtain a comparable index, the *Elderly Bias in Health Spending* (short EBiHS). That way it is possible to compare countries while taking into account their demographic situation. Although the Czech Republic and the Republic of Korea have a similar *health spending ratio*, at around 0.5, Korea's younger population leads to a higher bias in health spending. While both countries spent in total twice as much money on the health of the non-elderly compared to the elderly, the share of the population over 65 years old in Korea is a lot smaller than in the Czech Republic. This can interpreted as follows: the Republic of Korea spends around 4.1 times as much on an elderly person's health as on a non-elderly person's health. In the Czech Republic, this ratio only lies at around 2.75.

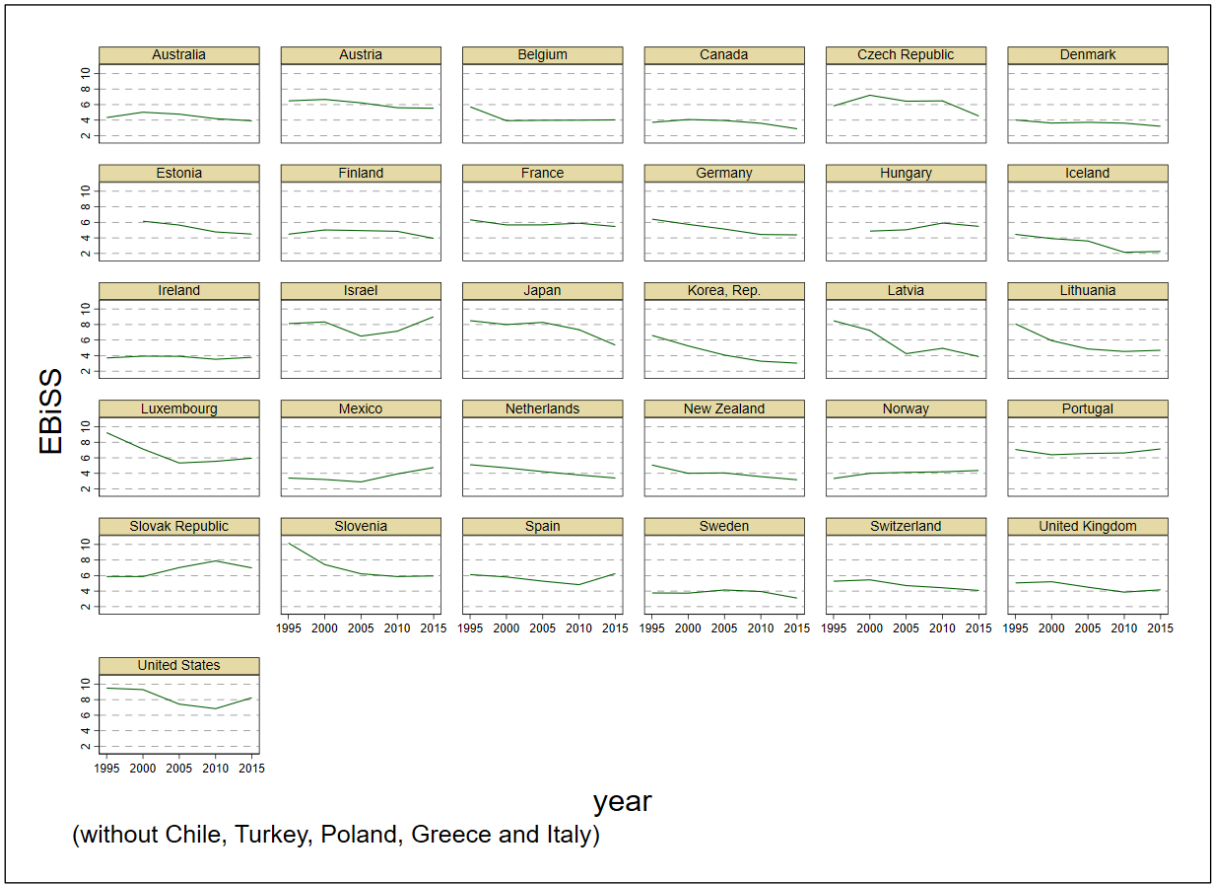
Table 2 – The Health Spending Ratio and the Elderly Bias in Health Spending

	CZECH REPUBLIC	**REPUBLIC OF KOREA**	**NETHERLANDS**		**GERMANY**
YEAR	**2010**	**2010**	**2005**	**2010**	**2005**
HEALTH SPENDING RATIO	0,5013	0,4918	0,6441	0,7288	0,8803
NON-ELDERLY TO ELDERLY (NEE) RATIO	5,4766	8,3516	6,0753	5,4777	4,2999
ELDERLY BIAS IN HEALTH SPENDING (EBIHS)	2,7455	4,1074	3,9133	3,9925	3,7851

Source: Author's own computation and configuration based on social spending data from the OECD SOCX database (2019), health spending data (Gesundheitsberichterstattung des Bundes 2020; OECD Statistics), education spending data (National Center for Education Statistics 2018b; World Bank 2019b), population data (World Bank 2019d) and exchange rate data (OECD 2020a)

However, it remains difficult to interpret these results. under a normative perspective and assess this in reference to the question of intergenerational justice. One thing that can be said, although only relying on very limited data, is that Vanhuysse's prediction that including health expenditure would increase the EBiSS cannot be supported. While this seems to be true for the Republic of Korea, the data for Germany and the Czech Republic shows the opposite with relatively strong decreases in the spending ratio. The absence of health spending in the dataset could therefore be interpreted as a weakness of the analysis. Faced with this unsolvable problem, at least until more age-specific health expenditure data is available, researchers should therefore be careful to put too much weight on small differences between countries' EBiSS values in a given year, but rather focus on the larger trends and differences in these countries.

Figure 19 – Elderly Bias in Social Spending (EBiSS)



Source: Author's own computation and configuration based on social spending data from the OECD SOCX database (2019), education spending data (National Center for Education Statistics 2018a, 2018b; Bolton 2019; World Bank 2019a, 2019b; Eurostat 2020), population data (World Bank 2019d) and exchange rate data (OECD 2020a)

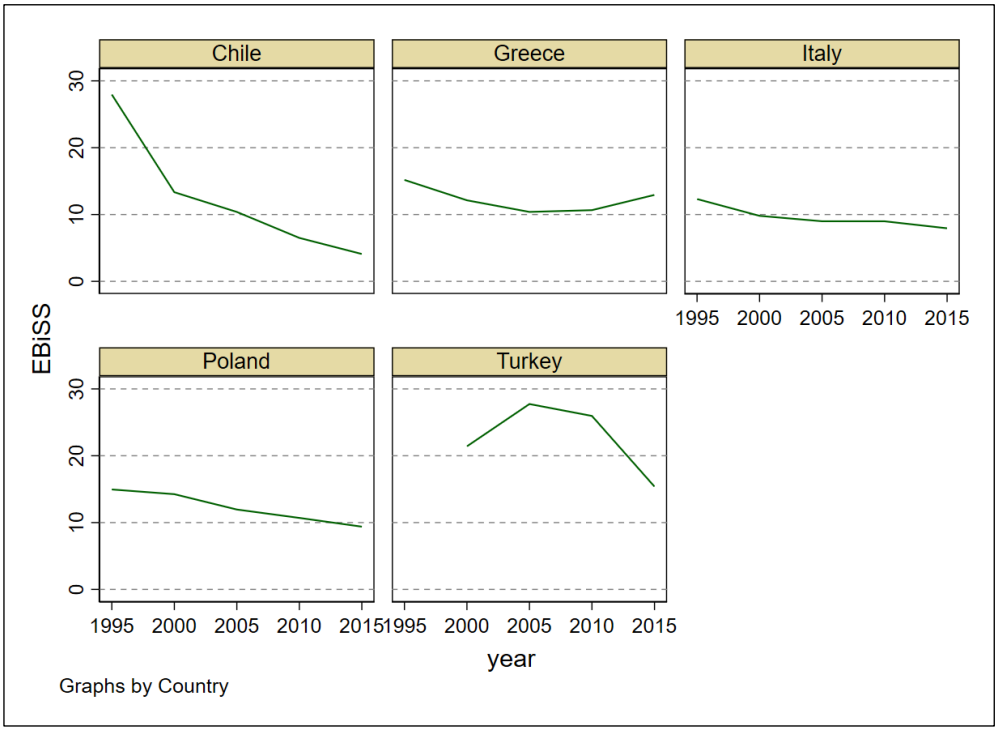
Figure 19 shows the development of the EBiSS for 31 of the 36 OECD countries and Figure 20 shows the development of the EBiSS indicator for the remaining five countries: Chile, Greece, Italy, Poland, and Turkey.[19] A look at both figures shows that overall the EBiSS value declined between 1995 and 2015, as the value decreased for most countries over time. The overall mean EBiSS decreased by 1.94 (equal to a reduction of 26%), from 7.42 to 5.48. There is only a small number of countries who have seen an increase in the EBiSS value from 1995 to 2015, namely Mexico (+1.35) , Slovak Republic (+1.11), Norway (+1.03), Israel (+0.89), Spain (+0.13), Ireland (+0.08) and Portugal (0.07). The biggest reductions can be observed in Chile (-23.86), followed by Poland, Latvia, Italy, and Slovenia with reductions of more than 4.

Especially the development in Chile is remarkable. A look at the disaggregated data shows that not only does the NEE ratio (the demographic multiplier in the indicator) go down slightly from 1995 and 2015 (from 13.6 to 8.4), we can observe very large increases in family spending (from about 120,000 to 2.7 million Chilean pesos), as well as education spending (from around 750,000 to 7.8 million Chilean

[19] The decision to separate the countries into those two groups was made out of two reasons. Firstly, to observe the five highest cases in more detail. And secondly, by excluding the high cases from the main graph, allowing a more nuanced look at changes in the other countries which had lower EBiSS values.

pesos). This brought down the spending ratio down significantly from 2.06 to 0.48. Multiplied by the smaller NEE, this can explain the strong reduction in Chile's EBiSS from around 28 to around 4. In Figure 19 and Figure 20 we can also observe a number of countries, who after a decline in the EBiSS over the first decade saw the value going up again after 2005 or 2010, such as Greece, Israel, Luxembourg, Mexico, and especially Spain and the United States. Furthermore, I would like to point out the very high value in Italy (and Greece), which points to a very high spending ratio, considering that Italy's population is one of the oldest populations in Europe. The following Figures 21-25 will contain the snapshot analyses for the EBiSS in 1995, 2000, 2005, 2010, and 2015.[20]

Figure 20 – EBiSS in Chile, Greece, Italy, Poland, and Turkey



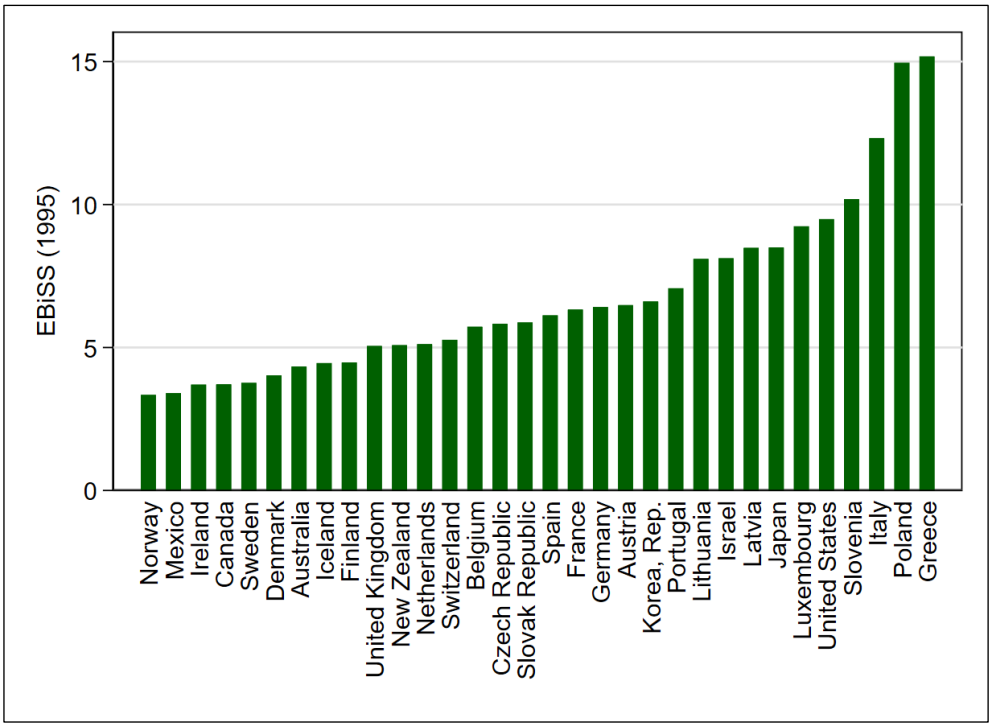
Source: Author's own computation and configuration based on social spending data from the OECD SOCX database (2019), education spending data (National Center for Education Statistics 2018b; Bundeszentrale für politische Bildung 2019; World Bank 2019b; Eurostat 2020), population data (World Bank 2019d) and exchange rate data (OECD 2020a)

Figure 21 shows the EBiSS values in 1995. The highest value is found in Chile with an EBiSS of around 28 (see Figure 20). Chile is followed by Greece and Poland, both with an EBiSS of around 15, and then by Italy (12.3) and Slovenia (10.2). The countries with the lowest EBiSS values in 1995 are Norway (3.3), Mexico (3.4), Ireland (3.7), Canada (3.7), Sweden (3.8) and Denmark (4). The average is at 7.42. Only the average of the conservative welfare regime is over the overall average, at 7.6. The lowest average

[20] They will not contain the values for Chile and Turkey. Their values are excluded because of their outlier status during the observational period (in Chile's case only in the beginning). That way we get a closer look at the differences between the other countries. Nevertheless, both countries will be included in the analysis and their values included in the comparative analysis if relevant. The values for both countries can be viewed in detail in Figure 20.

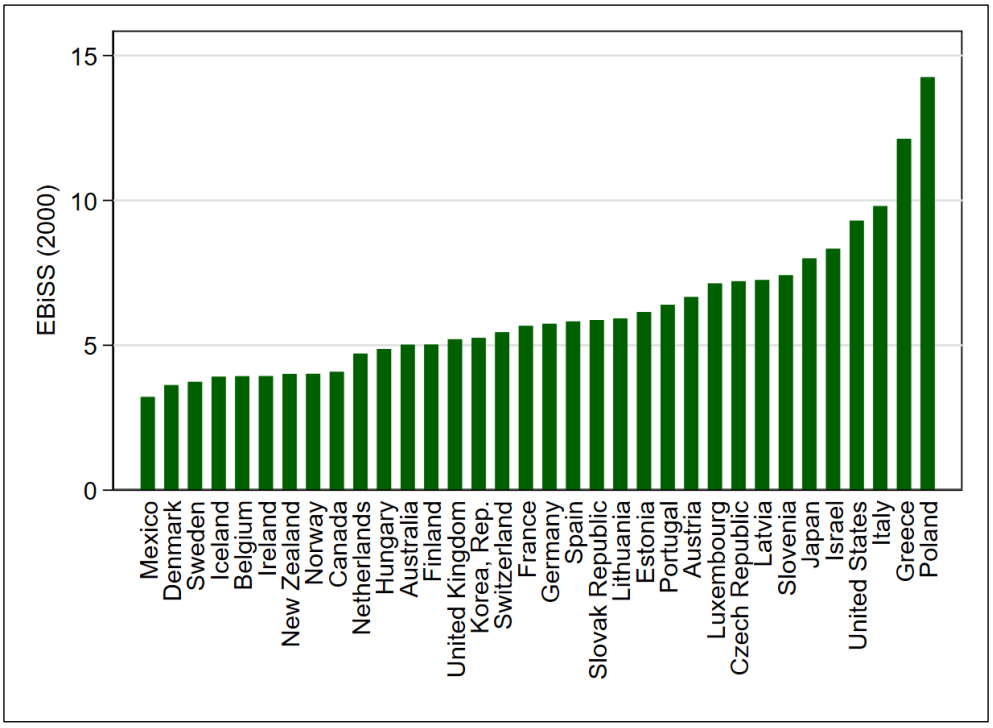
among the three welfare regimes can be found in the social democratic regime with a mean EBiSS of 3.9. The liberal welfare regime is in the middle with a mean EBiSS of 5.23.

Figure 21 – EBiSS in 1995



Source: Author's own computation and configuration based on social spending data from the OECD SOCX database (2019), education spending data (National Center for Education Statistics 2018a; Bolton 2019; World Bank 2019a, 2019b), population data (World Bank 2019d) and exchange rate data (OECD 2020a)

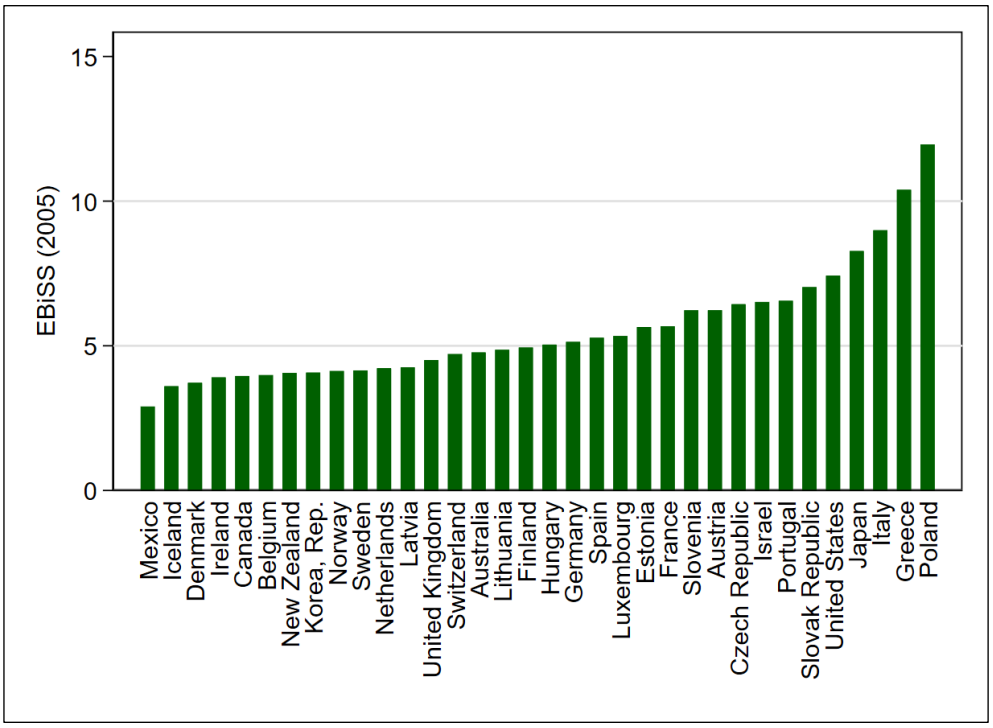
Figure 22 – EBiSS in 2000



Source: Author's own computation and configuration based on social spending data from the OECD SOCX database (2019), education spending data (National Center for Education Statistics 2018a; Bolton 2019; World Bank 2019a, 2019b), population data (World Bank 2019d) and exchange rate data (OECD 2020a)

Figure 22 shows the EBiSS values for the year 2000. The average in this year is 6.77. In 2000 the different welfare regimes are closer together, and the mean of each is below the overall average. The social democratic regime has a mean of 4.1, the liberal regime a mean of 5.26, and the conservative regime a mean of 6.63. While the mean for the liberal regime stayed relatively constant, the conservative regime reduced its mean and the social democratic regime increased it compared to 1995. While Chile is still among the countries with the highest values, it has already lowered its EBiSS by around 50% to 13.34[21]. The country with the highest EBiSS value in 2000 is Turkey (21.41), followed by Poland (14.25). Chile has the third highest value and is followed by Greece (12.13), Italy (9.8) and the United States (9.3). On the lower end of the spectrum, Norway has dropped several ranks from position one and is now the country with the eighth lowest EBiSS. The seven countries with the lowest EBiSS values are Mexico (3.21), Denmark (3.63), Sweden (3.74), Iceland (3.91), Belgium (3.93), Ireland (3.93) and New Zealand (4.01).

Figure 23 – EBiSS in 2005



Source: Author's own computation and configuration based on social spending data from the OECD SOCX database (2019), education spending data (National Center for Education Statistics 2018b; Bolton 2019; World Bank 2019a, 2019b; Eurostat 2020), population data (World Bank 2019d) and exchange rate data (OECD 2020a)

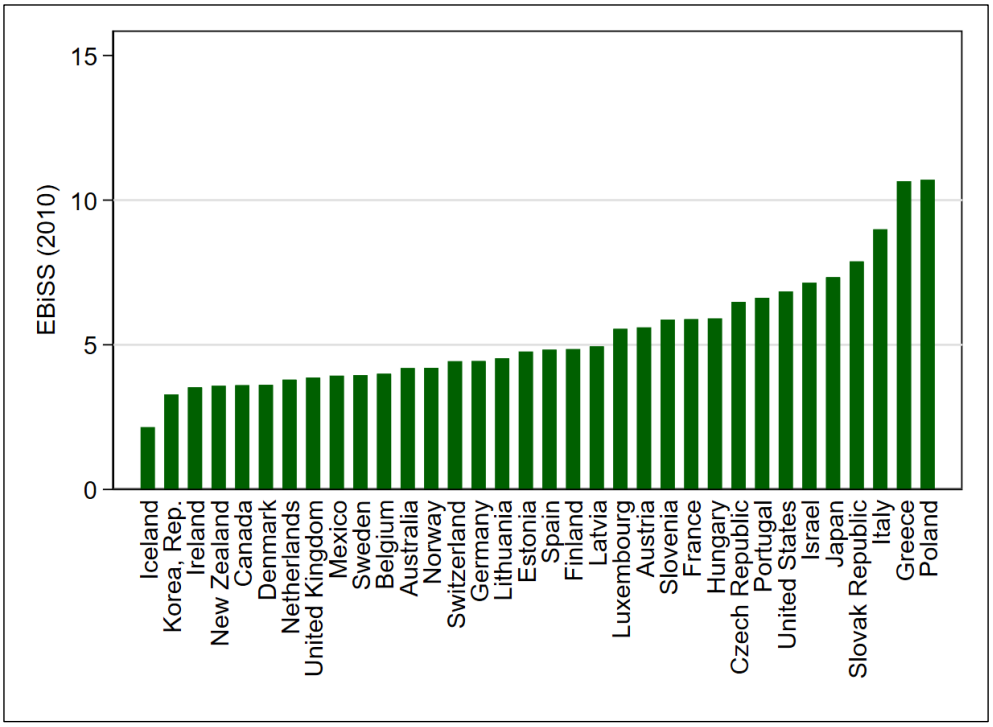
Figure 23 shows the EBiSS values for the year 2005. The sample mean has slightly decreased to an EBiSS of 6.3, and all three regime means are below the overall average. The social democratic regime has increased its mean to 4.24, the liberal regime has lowered its mean to 4.77, and the conservative has lowered its mean to 6.12. Turkey's EBiSS value has risen and with 27.74 is still the highest in the sample, its value more than twice as high as that of the countries with the second and third highest

[21] See Figure 20 for comparison.

values (Poland and Greece at 11.96 and 10.39 respectively). Greece is followed by Chile (10.39) and Italy (8.99). The lowest values are found in Mexico (2.9), Iceland (3.6), Denmark (3.7), Ireland (3.9) and Canada (3.96).

The Figure 24 shows the EBiSS values for 2010. Turkey has the highest EBiSS value (25.96), followed at a great distance by Poland and Greece (both with 10.7), followed by Italy (8.99) and the Slovak Republic (7.88). Chile has managed to lower its EBiSS value even further to 6.5, very close to the 2010 sample mean of 5.96. The countries with the lowest EBiSS values are Iceland (2.15), the Republic of Korea (3.29), Ireland (3.53), New Zealand (3.58), Canada (3.6) and Denmark (3.62). While the social democratic welfare regime still has the lowest average (4.16), the mean of liberal welfare regime is only slightly higher in 2010 at (4.27). The mean in the conservative welfare regime is higher, at 5.93. The average in all three welfare regimes has decreased since 2005.

Figure 24 – EBiSS in 2010



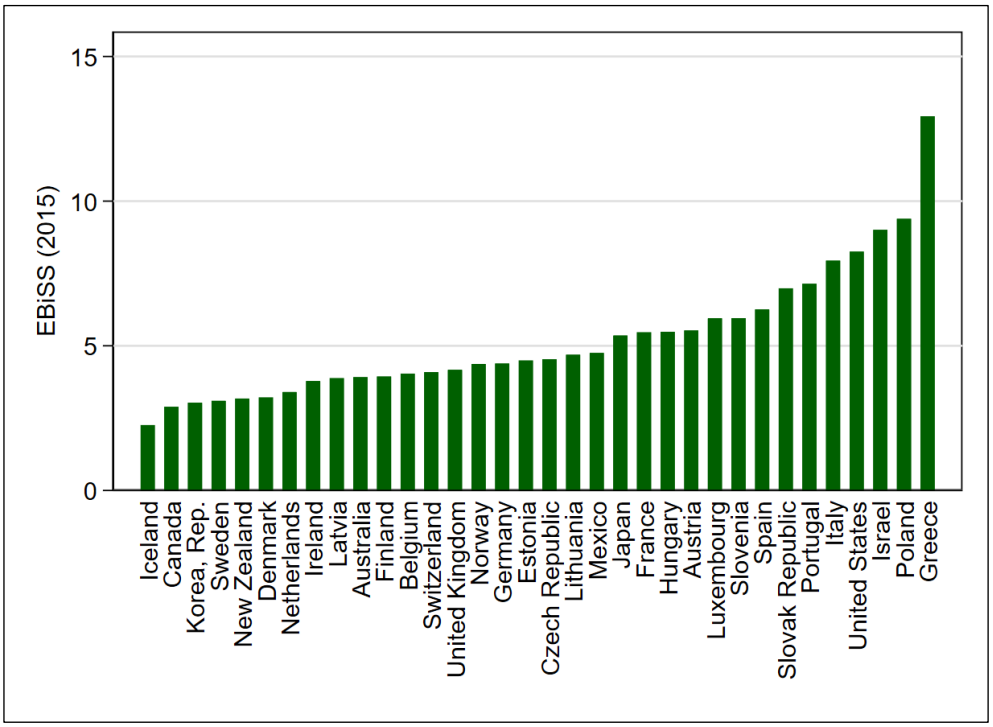
Source: Author's own computation and configuration based on social spending data from the OECD SOCX database (2019), education spending data (National Center for Education Statistics 2018b; Bolton 2019; World Bank 2019a, 2019b; Eurostat 2020), population data (World Bank 2019d) and exchange rate data (OECD 2020a)

Figure 25 shows the EBiSS values for 2015. It is remarkable that Turkey has decreased its EBiSS value to 15.39, but still remains the country with the highest EBiSS value. Chile on the other hand has managed to lower its EBiSS value to 4.1, now below the overall average of 5.48, mainly due to the above mentioned increases in family and education spending and a decline in the NEE ratio. The countries with the highest EBiSS values, after Turkey, are Greece (12.93), Poland (9.39), Israel (9.01), the United States (8.25) and Italy (7.94). Greece has increased its EBiSS value significantly since 2010,

similar to the United States. Both countries along with Israel and Spain are the countries with the highest increases in the EBiSS values between 2010 and 2015.

While the social democratic welfare regime's mean EBiSS value decreased from 2010 to 3.66, the mean of both the liberal welfare regime (now at 4.37) and the conservative welfare regime (now at 6.12) have increased since 2010.

Figure 25 – EBiSS in 2015



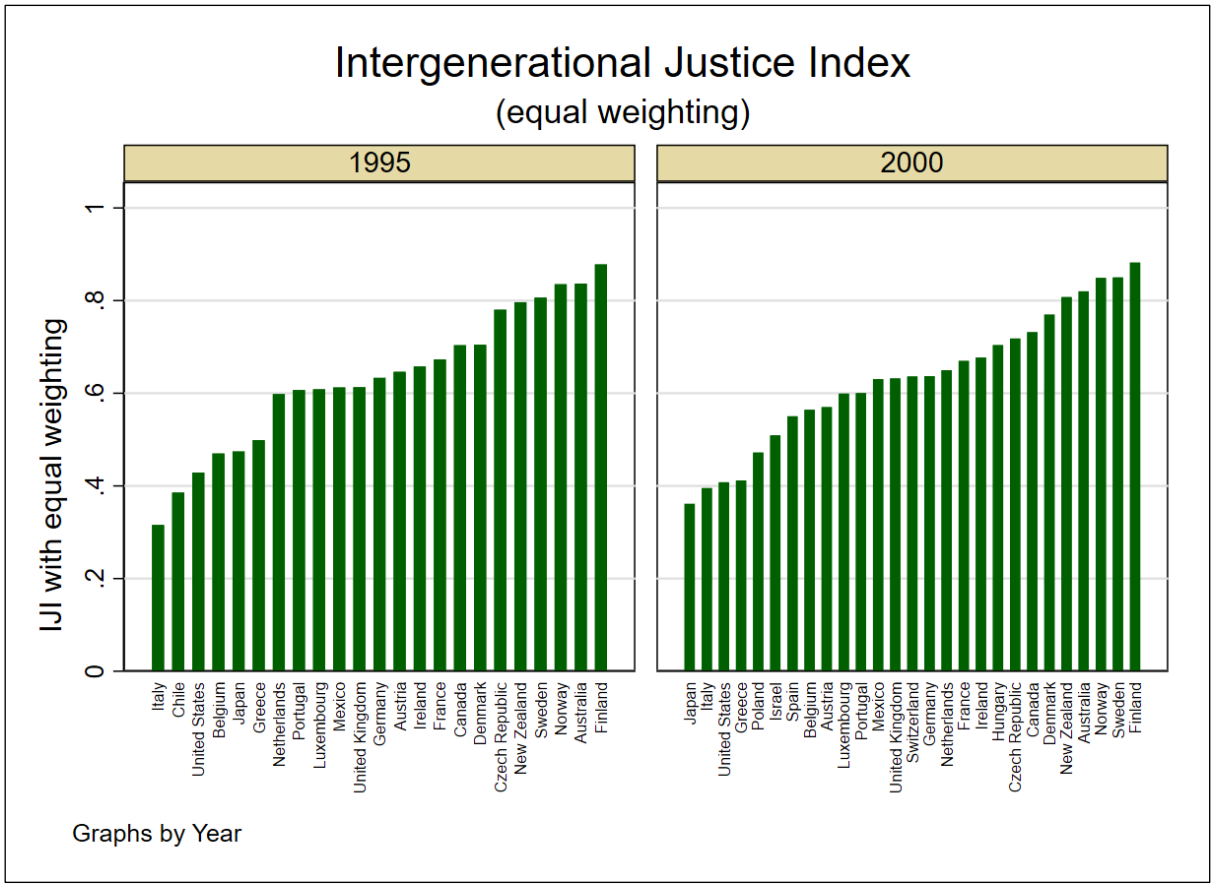
Source: Author's own computation and configuration based on social spending data from the OECD SOCX database (2019), education spending data (National Center for Education Statistics 2018b; Bolton 2019; Bundeszentrale für politische Bildung 2019; World Bank 2019a, 2019b), population data (World Bank 2019d) and exchange rate data (OECD 2020a)

Concluding on the trends and levels observed here, we can make a number of remarks. Firstly, the overall mean EBiSS value in the sample decreased over time from 1995 to 2015. Secondly, Chile observed the steepest decline in its EBiSS value thanks to strong increases in education and family spending and somewhat thanks to a decreasing NEE ratio. Thirdly, the social democratic and liberal welfare regime on average have lower EBiSS values than the conservative welfare regime with the social democratic regime observing the lowest mean in all years. And lastly, there were significant increases in some countries after 2005 and 2010, pulling up the averages of the liberal and conservative welfare regime. One suggestion for this observation could be an effect of the Great Recession in 2008-2009 and the ensuing austerity policies.

4.5 Intergenerational Justice Index

The fifth part of the analysis deals with the join indicator IJI. The four previous dimensions and their four main indicators (net footprint per person, child poverty rate, debt per child, and the EBiSS) are joint together with different weights. As mentioned above, in my analysis I will apply different specifications: an equal weighting, a climate-heavy weighting, and a specification to both weightings that punishes countries with a high child over old age poverty ratio (this last specification starts in 2010). All four indicators imply that higher values represent a worse performance. For the joint indicator IJI, higher values imply a better performance, and on average correspond to lower values in the four base indicators. This means that a country performing well on all base indicators will have an IJI value closer to 1 and a country performing badly on all base indicators will have an IJI value closer to 0. For data availability reasons I have omitted Iceland and Turkey from the analysis of IJI indicators. It is interesting to remark though, that Turkey, due to its bad performance on child poverty and the EBiSS indicator was among the countries with the lowest IJI values, for the years in which data was available.

Figure 26 – Intergenerational Justice Index with equal weighting (1995 and 2000)



Source: Author's computations

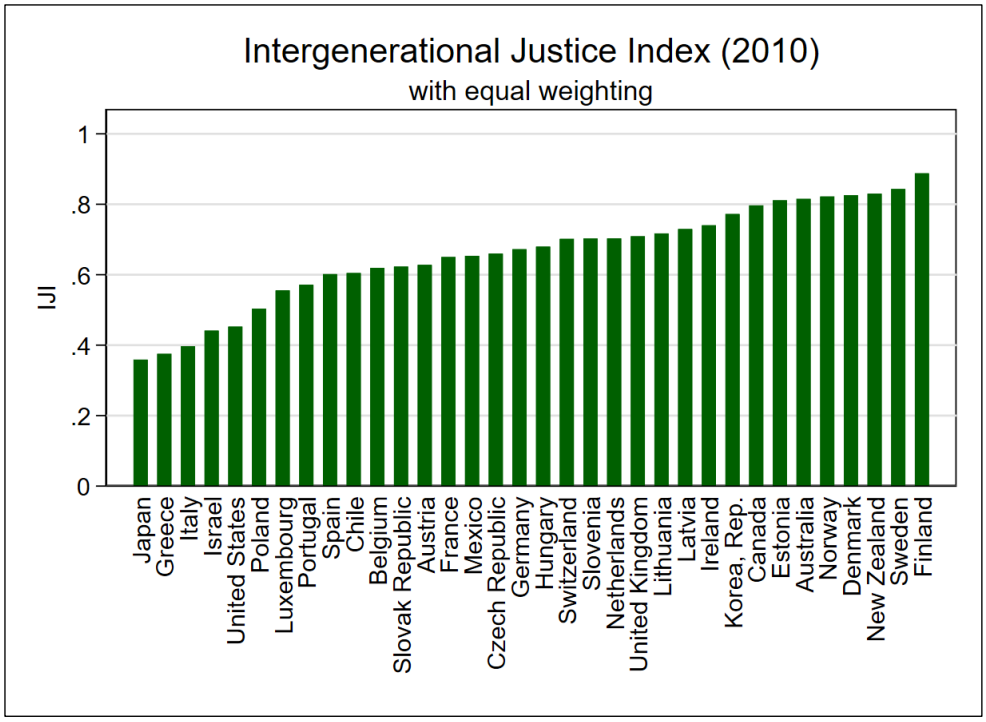
Figure 26 shows the IJI values with the equal weighting method for the years 1995 and 2000. The best performing country is Finland (with a value of 0.88 in both years), followed by Australia, Norway,

Sweden, and New Zealand (all with values of 0.8 or higher in both years). The worst performers are Italy in 1995 (with 0.32), followed by Chile, the United States, Belgium, Japan, and Greece (all with values below 0.5). The worst performer in 2000 is Japan (with 0.36), followed by Italy, the United States, and Poland (all below 0.5). In both 1995 and 2000 the IJI is the highest in the social democratic welfare regime (0.81 in 1995 and 0.84 in 2000), followed by the liberal regime (0.67 and 0.68), and by the conservative regime (0.56 and 0.57).

Figure 27 shows the IJI values in 2010 with the equal weighting method. The best performing countries are Finland (with a value of 0.89), followed by Sweden, New Zealand, Denmark, Norway, Australia, and Estonia (with values over 0.8). The worst performer here is Japan (with a value of 0.36), followed by Greece, Italy, Israel, United States and (with values of up to 0.5). The social democratic regime has the highest average (0.85), followed by the liberal regime (0.72), and the conservative regime (0.59). This order was identical in 2005 with similar averages.

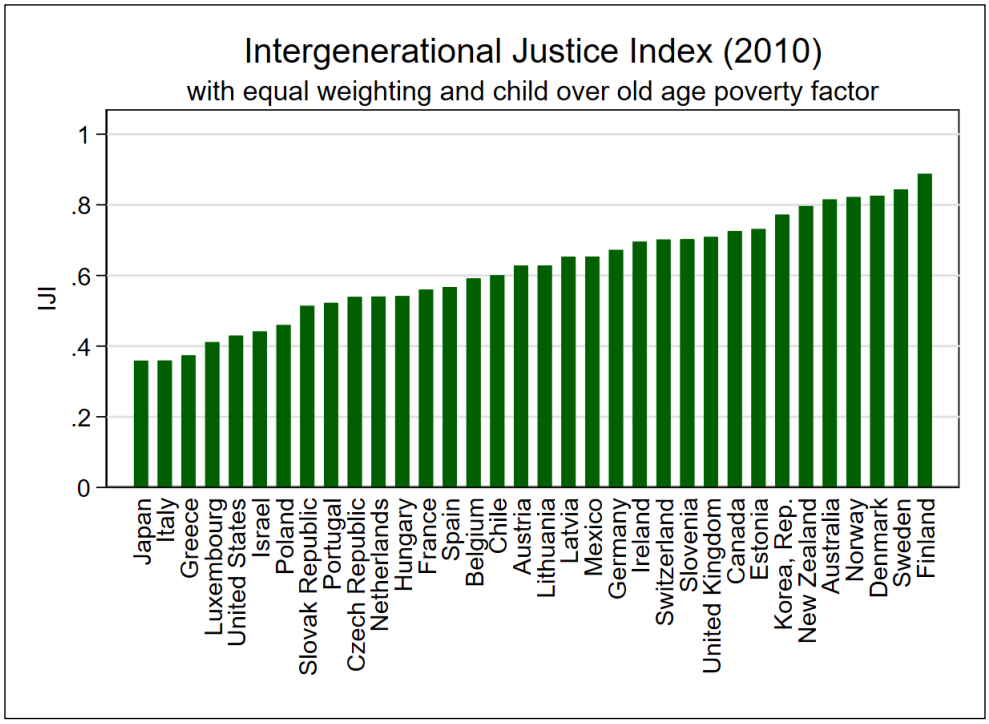
Figure 28 shows the IJI with a specification that takes into account when a country's child poverty rate is higher than its old age poverty rate. To implement this specification, I divide the normalised child poverty value by the ratio of child over old age poverty, in case this ratio is bigger than one.

Figure 27 – Intergenerational Justice Index with equal weighting (2010)



Source: Author's computations

Figure 28 – Intergenerational Justice Index with child over old age poverty factor (2010)

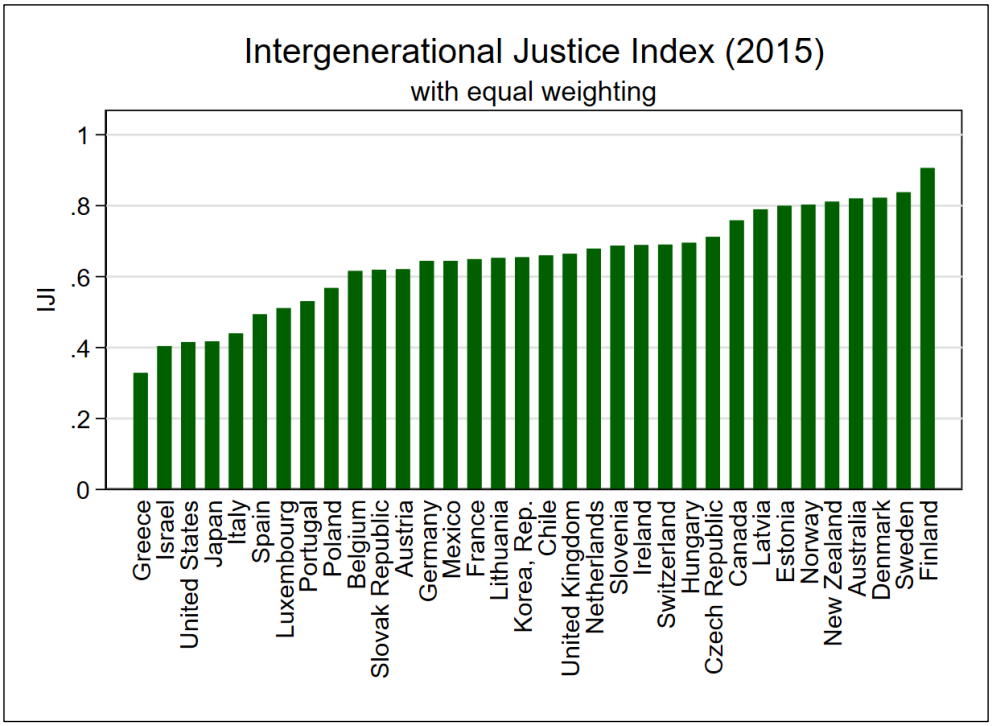


Source: Author's computations

Therefore, Figure 28 shows IJI values that are unchanged in some countries and values that are changed through the above mentioned specification. The three countries with the highest child over old age poverty ratio in 2010 (the Netherlands, Luxembourg, and Hungary) all saw a strong decrease in their IJI value. This is especially prominent with the Netherlands, which dropped from an IJI of 0.7 down to 0.54. However, also for a country like the Czech Republic, with a child over old age poverty ratio half that of the Netherlands, the IJI would drop in its value from 0.66 down to 0.54. It is also interesting to remark, that with the poverty ratio specification, New Zealand drops out of the top five countries. While this specification does not change anything for the average of the social democratic regime, it lowers both the average of the liberal (from 0.72 to 0.7) and the conservative regime (from 0.59 to 0.55).

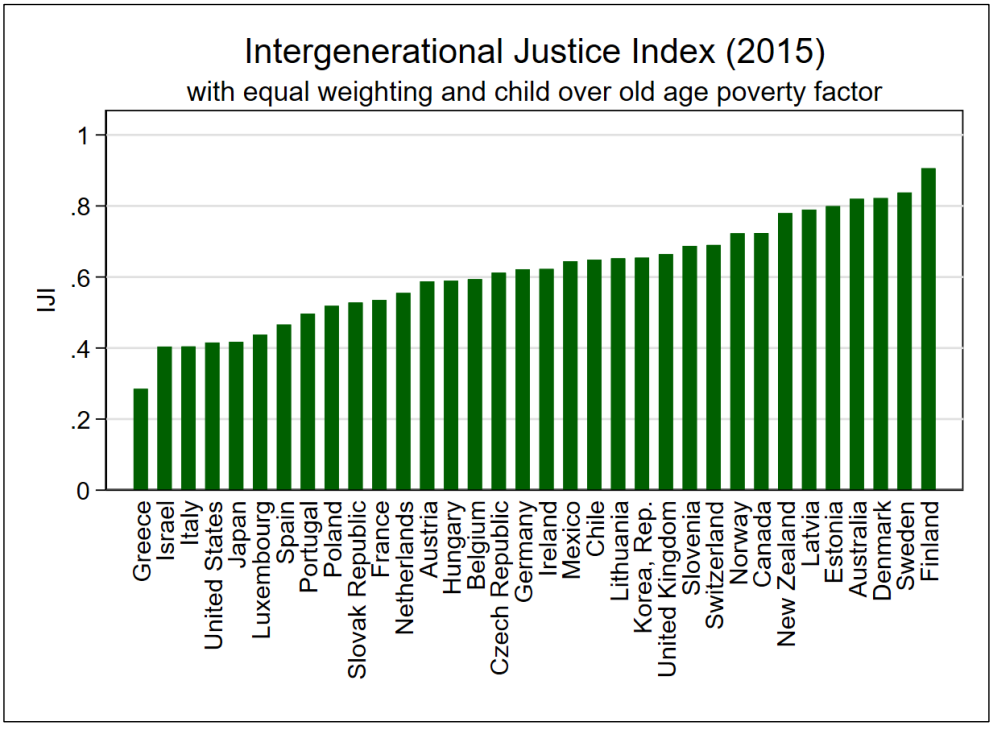
Figure 29 shows the IJI value with the equal weighting in 2015. As in all time slots before, the best performing country is Finland (0.91), followed by Sweden, Denmark, Australia, New Zealand, Norway, and Estonia (all with values of 0.8 or higher). The worst performing countries are Greece (0.33), followed by Israel, the United States, Japan, and Italy (all with values below 0.45). The best performing regime is again the social democratic regime (0.84), followed by the liberal (0.7), and the conservative regime (0.57).

Figure 29 – Intergenerational Justice Index with equal weighting (2015)



Source: Author's computations

Figure 30 – Intergenerational Justice Index with child over old age poverty factor (2015)



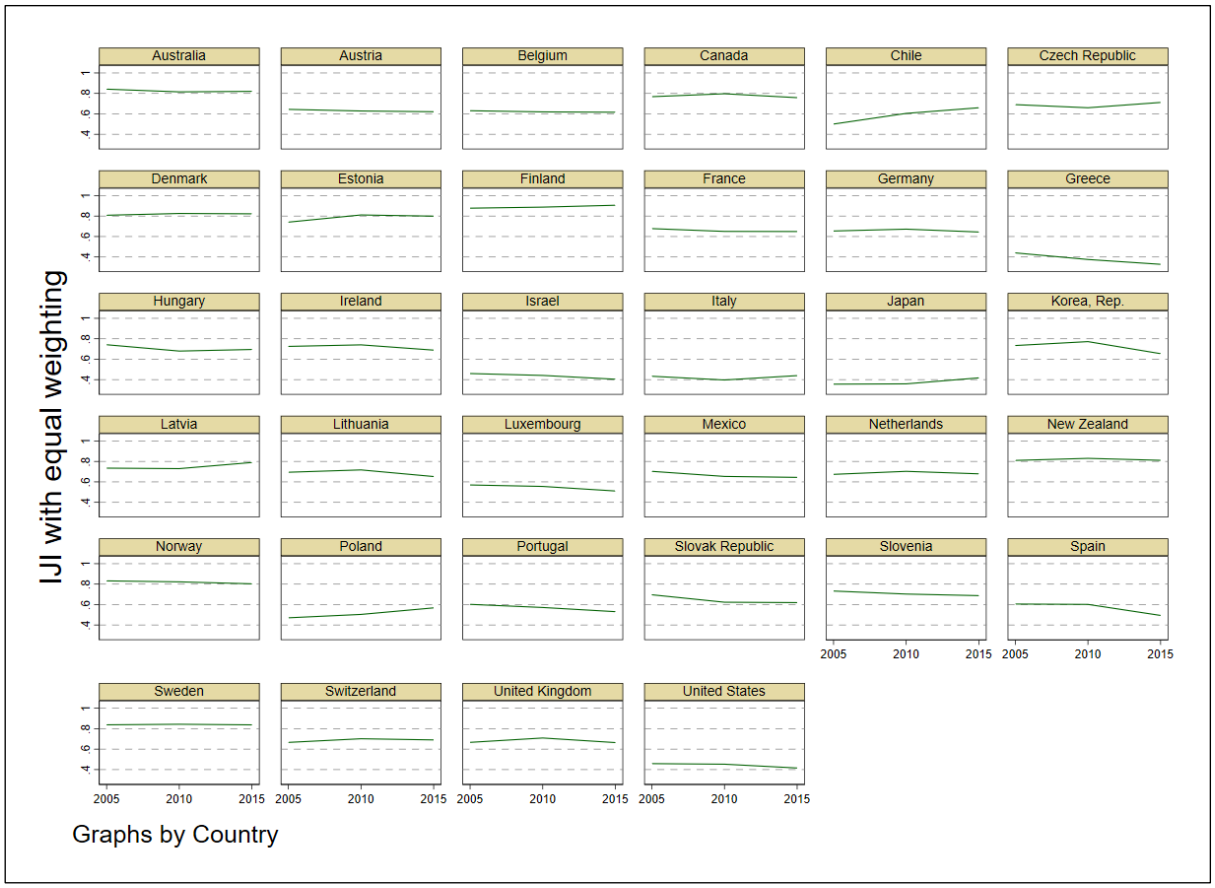
Source: Author's computations

Figure 30 shows the IJI value with an equal weighting, but we are including a factor that takes into account the child over old age poverty ratio, as was done in Figure 28. The inclusion of the specification for the child over old age poverty ratio again leads to some drops in the IJI values, especially for those countries with a large child over old age poverty ratio (Slovak Republic, the Netherlands, France,

Hungary, and Czech Republic). In 2015, also the average of the social democratic regime would be lowered by the inclusion (to 0.82), due to a ratio of 1.65 in Norway, leading to a lower normalised child poverty indicator for Norway. The average for the liberal regime is also lowered (from 0.7 to 0.67), as well as the average of the conservative regime (from 0.57 to 0.52). However, the overall pattern and ranking between the countries and especially the regimes remains relatively unchanged, also in 2015.

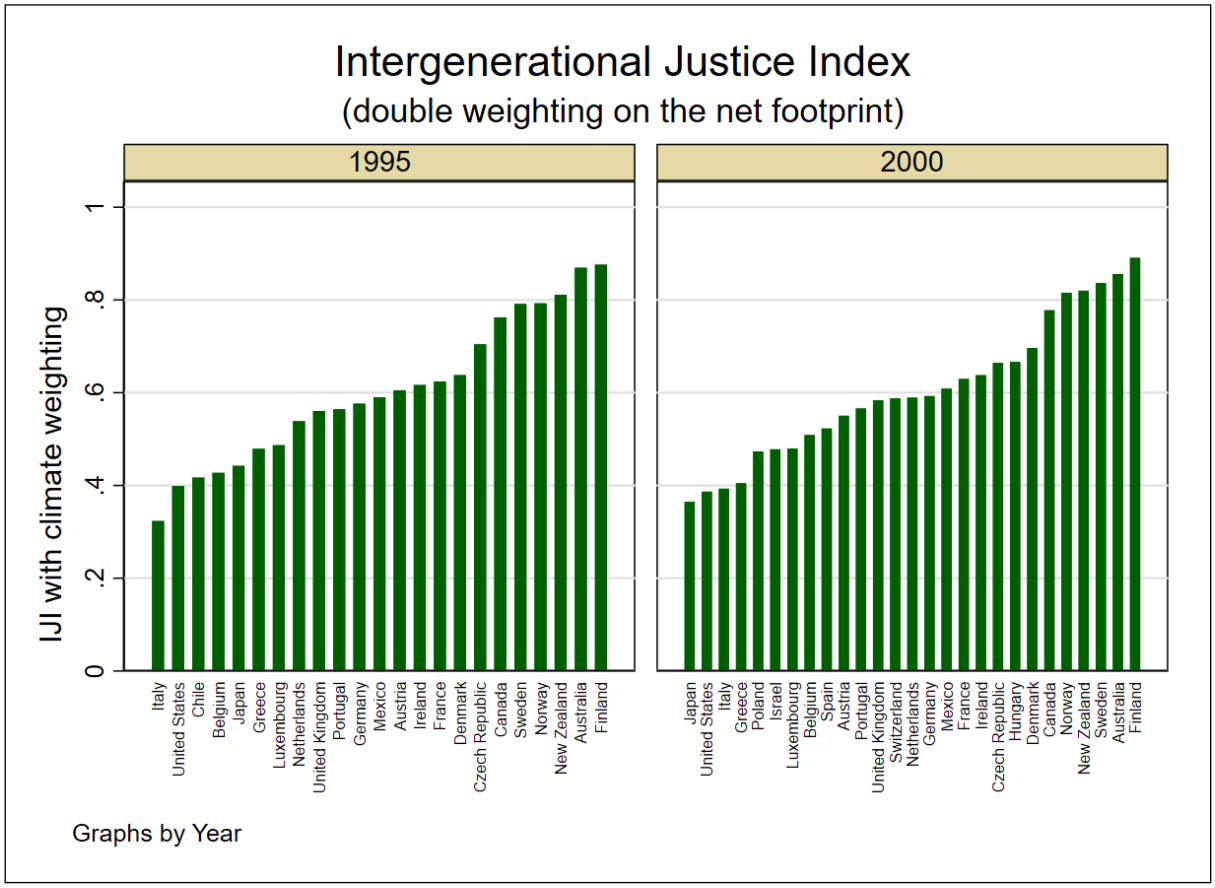
Figure 31 offers summarising context for the trends in the equally weighting IJI between 2005 and 2015. We can see in the graphs that the IJI stays relatively constant for most countries, but that there are also some visible changes. Spain, Greece, and the Republic of Korea for example saw a strong decrease in their IJI value after 2010. A downward trend, albeit less strong, can also be observed in some other countries. However, we can also observe positive developments in the sample, for example a strong increase in the IJI value of Chile.

Figure 31 – IJI with equal weighting (trend)



Source: Author's computations

Figure 32 – Intergenerational Justice Index with climate-heavy weighting (1995 and 2000)

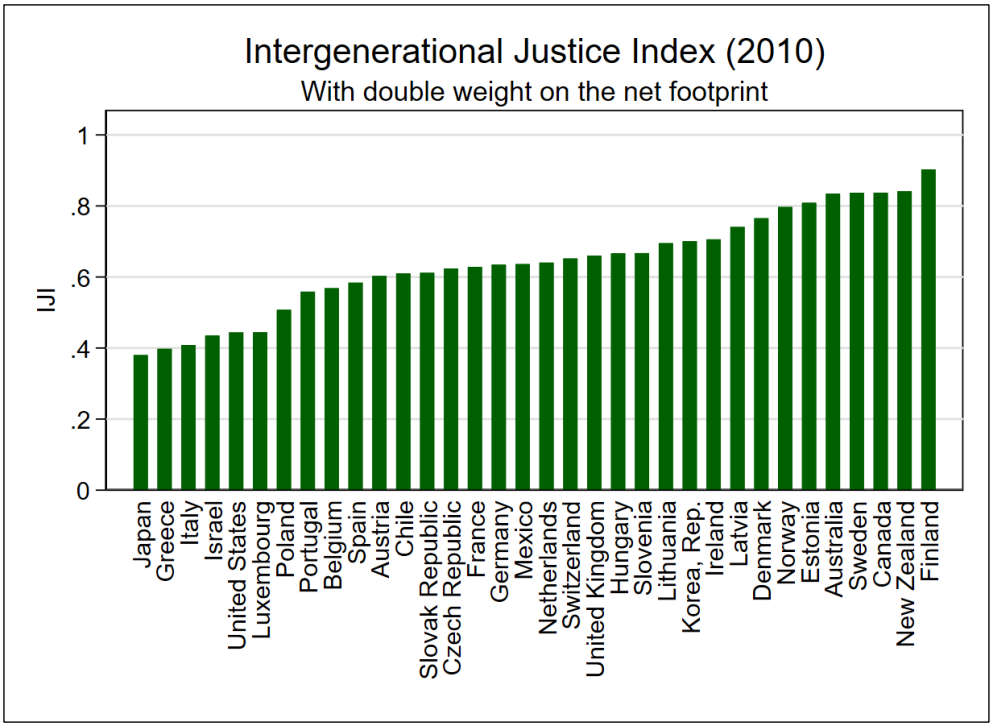


Source: Author's computations

Figure 32 shows the IJI with the climate-heavy weighting for the years 1995 and 2000. This variation gives a double weight for the net footprint. The best performer is Finland (with an IJI of 0.88 in 1995 and 0.89 in 2000).[22] Finland is followed by Australia, New Zealand, Norway, and Sweden (all with values no lower than 0.79 in 1995 or 0.82 in 2000). The worst performer in 1995 is Italy (0.32), followed by the United States, Chile, Belgium, Japan, Greece, and Luxembourg (all with values of no more than 0.5). The worst performer in 2000 is Japan, followed by the United States, Italy, Greece, Poland, Israel, and Luxembourg (all with values of no more than 0.5). The average in the social democratic regime, now lower than with the equal weighting, is at 0.78 in 1995 and at 0.81 in 2000. The average values of the liberal regime (0.67 and 0.68), again lower than those of the social democratic regime, are mostly similar to the averages under the equal weighting. The lowest average is found again in the conservative regime with 0.52 in 1995 and 0.54 in 2000, slightly lower than the averages with the equal weighting.

[22] Applying different weightings with each putting the double weight on a different indicator all lead to the same result of Finland holding the highest IJI value.

Figure 33 – Intergenerational Justice Index with climate-heavy weighting (2010)



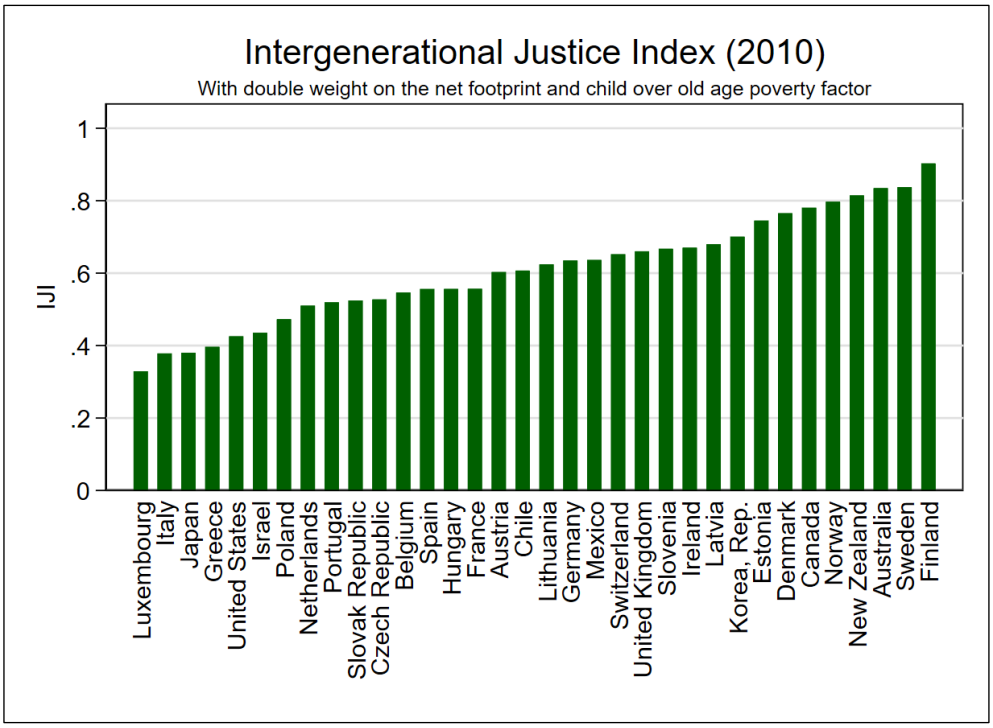
Source: Author's computations

Figure 33 shows the IJI with the climate-heavy weighting for 2010. The ranking at the top and the bottom of the sample is not very different to either that of previous years, or to that of the equal weighting. The best performing country is Finland (0.90), followed at some distance by New Zealand, Canada, Sweden, Australia, Estonia, and Norway. There is however, one recognisable difference in this ranking compared to the equally weighted IJI values. The countries of the liberal regime with a negative net footprint (Australia, New Zealand, and Canada) are performing better, due to the higher weight on the net footprint, the indicator in which they are particularly strong. The social democratic regime has the highest average with 0.83, followed by the liberal regime at 0.72, and the conservative regime at 0.57. The social democratic average is slightly lower than in the equal weighting, which could be explained by Denmark's relatively high net footprint, which is now weighted more heavily, pulling down the average performance.

Figure 34 shows the IJI for 2010 with the climate-heavy weighting but including the child over old age poverty specification to see how this changes the situation. As with in the comparison in the equally weighted IJI values, we can see that countries like the Netherlands, the Czech Republic, Luxembourg, and the Slovak Republic drop significantly in their IJI value. Similar also to the development in the equally weighted IJI values, including the child over old age poverty factor does not change the average of the social democratic regime in 2010, but slightly lowers the averages for the liberal and the

conservative regime. A look at the data shows that in 2015 also the social democratic average is lowered with the inclusion, due to Norway's high child over old age poverty ratio, which is at 1.65.[23]

Figure 34 – Intergenerational Justice Index - climate-heavy weighting - child over old age poverty factor (2010)



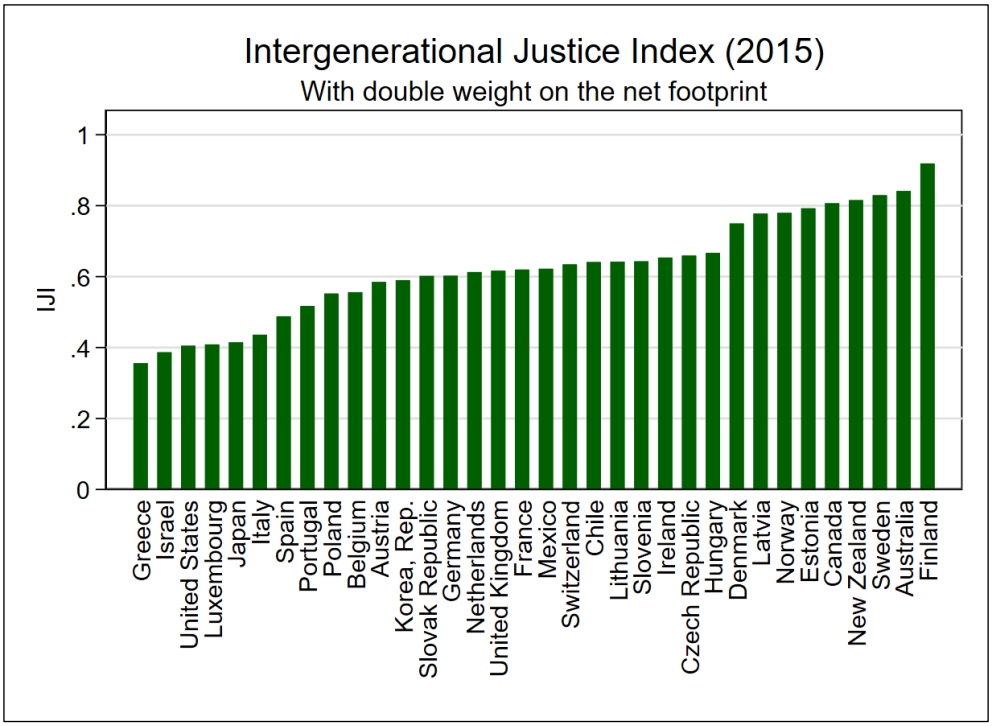
Source: Author's computations

Figure 35 shows the IJI values with a climate-heavy weighting for 2015. The best performer in the sample is Finland (0.92), followed by Australia, Sweden, New Zealand, Canada, and Estonia (all with values of 0.79 or higher). The worst performer is Greece (0.36), followed by Israel, United States, Luxembourg, Japan, and Italy (with values between 0.39 and 0.44). The best performing regime is the social democratic regime (0.82), followed by the liberal regime (0.69), and the conservative regime (0.54).

Figure 36 shows, similar to Figure 31, the trends in the IJI with the climate-heavy weighting between 2005 and 2015. Again we see a mixed field of trends in the different countries. The three countries with visible declines, Greece, Republic of Korea, and Spain, are also seeing strong declines in this modification of the IJI. As in Figure 31 we can also see a strong increase in the IJI value in Chile, albeit less pronounced as in the equally weighted IJI value.

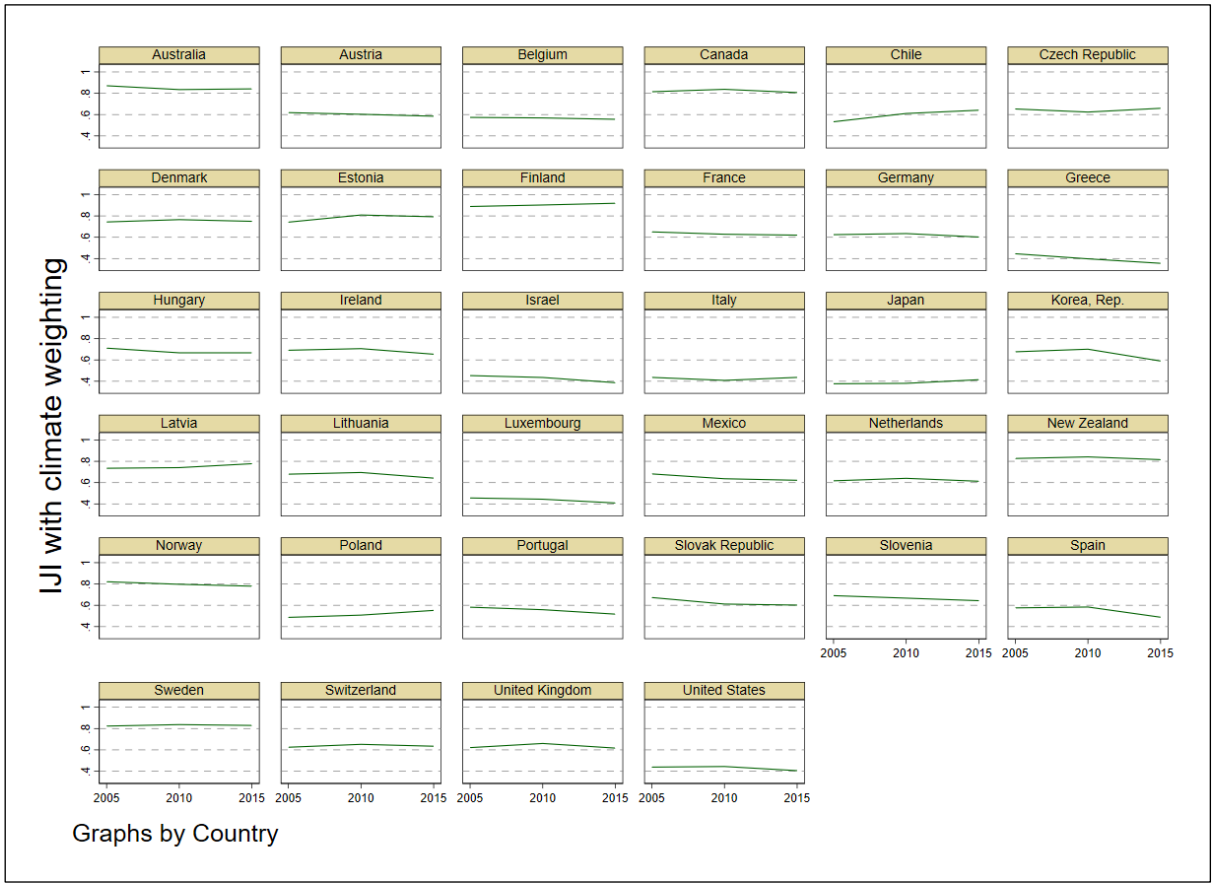
[23] Due to the scope of this work, not all graphs can be shown in the text. For the example the bar graph for the 2015 IJI with the climate-heavy weighting with the child over old age poverty specification will therefore be included in the appendix with other additional data and visualisations.

Figure 35 – Intergenerational Justice Index with climate-heavy weighting (2015)



Source: Author's computations

Figure 36 – IJI with climate weighting (trend)



Source: Author's computations

Concluding on the trends and levels observed here, we can make a number of remarks. Firstly, the countries from the social democratic welfare regime are performing best on average throughout the

whole observational period. Secondly, Finland performs best out of the whole sample throughout all different weightings. Thirdly, countries of the liberal regime with a negative net footprint are also performing good on the different IJI measures, but of course with higher values on the climate-heavy weighting. And fourth, countries like Japan, Greece, Italy, and the United States are performing badly in all the different specifications shown above. And lastly, on average, the countries in the conservative welfare regime are performing worst out of the three regimes applied here.

4.6 Special Cases

Demographic Comparison

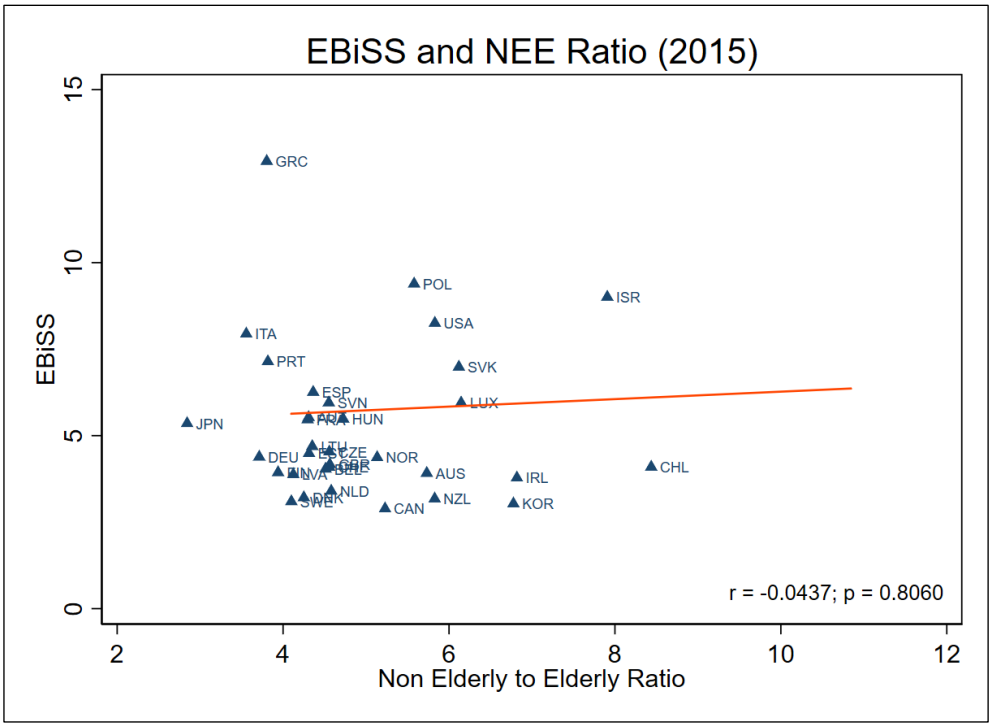
In this subchapter I want to take a closer look at six countries and look how they perform on the indicators and on the IJI, compared to each other and compared to countries with similar demographics (referring to the NEE ratio), in the most recent snapshot, 2015. While Finland and Denmark are performing well (particularly Finland, which has the highest IJI for all years and weighting methods presented above), Hungary and Germany are showing more mixed results. Lastly, the IJI values for Japan and the United States are among the lowest in the sample for all periods and weighting methods presented here. Since an extensive analysis into the economic and social developmental drivers behind these developments would go beyond the scope of this research, I want to offer a comparative descriptive analysis along the lines of demography.

Figure 37 shows the EBiSS values of the countries in 2015 plotted over the NEE ratio.[24] While it is hard to compare Japan to other countries due to its extreme demographic position as the country with the oldest population in the sample, comparisons are possible for the other cases. The NEE ratio in the United States, a country with one of the highest EBiSS values, is similar to that in Australia and New Zealand. A comparison of the EBiSS values shows that even though the USA has a similar population ratio, the EBiSS value is about twice the size of that in the other two countries. The similar NEE ratio means that the USA has a significantly higher spending ratio than the other two countries. Germany and Finland have a relatively low NEE ratio, pointing to a relatively old population, but with an EBiSS value below five they are below the sample average. Germany and Finland are doing significantly better on this indicator than for example Portugal, Italy, and especially Greece, which all have higher EBiSS values (significantly higher for Greece), while all countries have a similar NEE ratio. A similar observation, although with less severity, can be made through a comparison between Denmark and countries with a similar NEE ratio. Denmark's EBiSS value is among the lowest in the sample,

[24] Iceland was omitted as an outlier and Turkey and Mexico were omitted as outliers to obtain a better view on the small differences between the other countries. This was applied to all graphs in this subchapter 4.6.

significantly lower than, for example, in Spain, France, and Austria. It is more difficult to make a strong conclusion for Hungary, but a comparison with the Netherlands – similar NEE but lower EBiSS value – shows that Hungary's spending ratio is higher. In the red line, which is the fitted line for the sample, we can also see that demography does not condemn a country to unsustainable polices. If an older population would lead to a higher EBiSS value, this line should be sloping downwards. Furthermore, we can see that there is no significant correlation between the two variables in a bivariate correlation.

Figure 37 – EBiSS and Non-elderly to Elderly Population Ratio (2015)

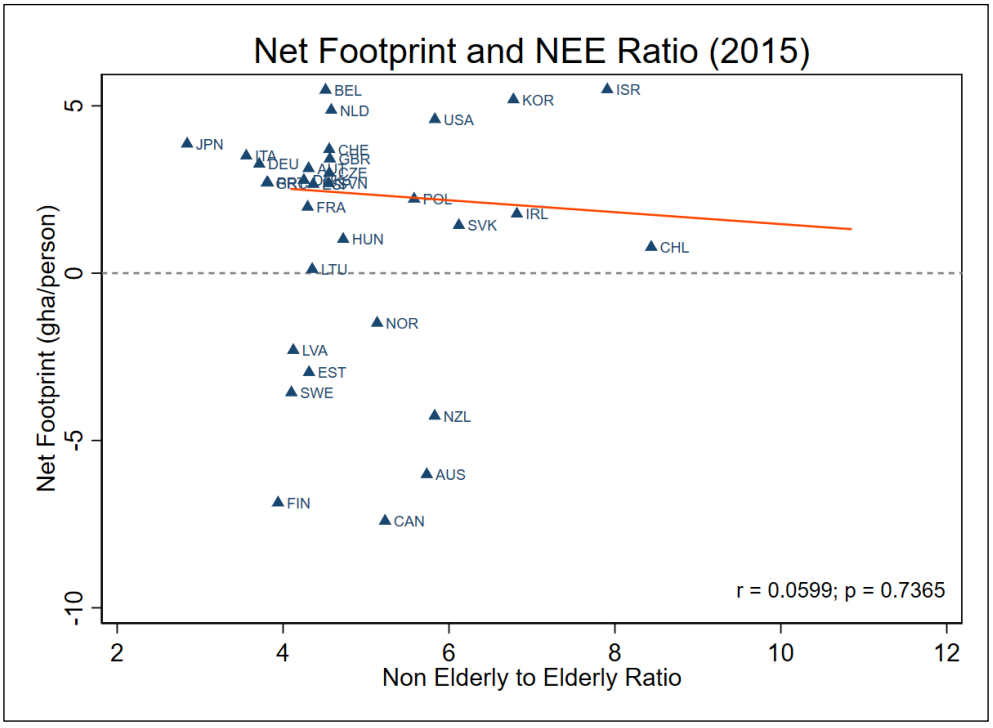


Source: Author's own computation and graphical configuration based on social spending data from the OECD SOCX database (2019), education spending data (National Center for Education Statistics 2018b; Bolton 2019; Bundeszentrale für politische Bildung 2019; World Bank 2019a, 2019b), population data (World Bank 2019d) and exchange rate data (OECD 2020a)

Figure 38 plots the net footprint per person over the NEE ratio. The net footprint per person in the United States, while also being one of the highest in the sample, is significantly higher than that of the demographically similar countries Australia and New Zealand. The comparison between Hungary and ,for example, the demographically similar Netherlands reveals a higher footprint per person for the latter. Denmark on the other hand has a significantly higher net footprint per person than its direct neighbour Sweden and higher than Estonia and Lithuania (all with a similar NEE ratio). While Finland and Germany have similar NEE ratios, Finland has strong negative net footprint per person and Germany's net footprint per person is higher than the average. Japan, as mentioned above is the oldest country in the sample according to the NEE ratio and therefore stands out in this plot as well. It has a similar net footprint compared to Switzerland, whose population is a lot younger according to the NEE ratio. While it goes beyond the scope of this research to interpret such a comparison in great detail, it can be said that Japans footprint is also remotely similar (slightly lower) to that in the United States

and in the Republic of Korea. Furthermore, a look at the pattern of the data shows that it takes more than just an old population to lead a country towards an unsustainable policy stance. The red fitted line in this plot is sloping downwards slowly, but the data points are relatively sparse towards the right side of the graph, making any conclusion highly speculative. Furthermore, we can see that there is no significant correlation between the two variables in a bivariate correlation.

Figure 38 – Net Footprint per Person and NEE Ratio (2015)

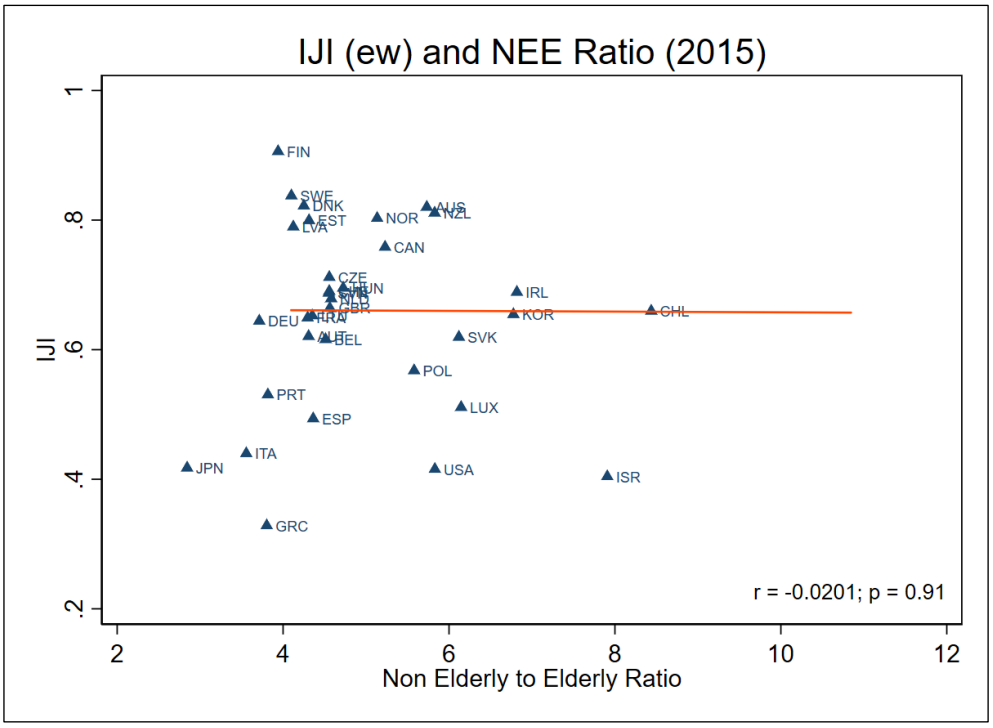


Source: Author's graphical configuration based on data from the Global Footprint Network (2019) and population data from the World Bank (2019d)

Figure 39 plots the 2015 IJI values with an equal weighting over the NEE ratio. Drawing on the aforementioned notion of sustainable politics, a look at the IJI values compared by demography can offer some interesting insights. In line with the disaggregated results from the two previous graphs, we can observe that the United States has a far lower IJI value than Australia and New Zealand, although all three have a similar NEE ratio. Japan on the other hand also has a very low IJI value, but a significantly smaller NEE ratio than the United States, and even smaller, when we are comparing it to another country with a particularly low IJI value in 2015, Israel. Germany's medium IJI value (which is significantly higher than that of Greece even though both have a similar NEE ratio), but even more so the very high IJI values in Finland and Denmark show that it is possible to work towards more intergenerational justice in spite of an older population. Hungary's IJI value is comparatively high, while its NEE ratio is below average, making it a relatively old population. Again we have a red fitted line which is not showing a clear effect of the population ratio on the country performance, with the fitted

line in Figure 39 being nearly horizontal. And we can see that there is no significant correlation between the two variables in a bivariate correlation.

Figure 39 – Intergenerational Justice Index and the NEE Ratio (2015)



Source: Author's computation and graphical configuration with population data (World Bank 2019d)

Summary for the Special Cases

To see which indicators are responsible for the countries' positions on the IJI indicator, I will look at their comparative performance on the four different indicators. Finland, with its negative net footprint per person is the second best on the first indicator, behind Canada. Finland has the second lowest child poverty rate, behind Denmark. The country's child over old age poverty ratio is below one. This means that this factor would not have an impact on Finland's performance. Finland's debt per child ratio is slightly below the average debt per child. However, this remains the only of the four indicators on which Finland did not perform particularly well. Finland's EBiSS value is also very low and far below average[25], but still higher than that of Denmark for example. This combination of a very good performance on the first two indicators and a good performance on the last two indicators led to Finland's very high IJI value. Denmark, on the other hand, does not perform very well on the first indicator with a relatively high net footprint per person, but continuously had the lowest child poverty rate in the sample. Denmark's debt per child level is relatively low, and its EBiSS value is among the lowest in the sample.

[25] Below average EBiSS is pointing towards a good performance.

Although Hungary's net footprint per person is positive, it is very close to a neutral value and for example lower than that of Germany. The same goes for the child poverty rate. Both countries have a relatively low child poverty rate (just above 10%), with Hungary's value being slightly smaller. However, it is important to remark, that the child over old age poverty ratio in Hungary in 2015 was very high (around 3), while Germany's ratio was just slightly about 1. This would mean, that applying the child over old age poverty factor, Hungary's IJI value would either drop below Germany's (for the equal weighting) or fall to a value just slightly above it (for the climate-heavy weighting). Hungary's EBiSS value is relatively high (also higher than Germany's), but under the IJI formulas used here, this would remain the only indicator in which the country is performing relatively badly. This combination leads to a relatively good IJI value over all (slightly below 0.7), while Germany's value is lower (between 0.61 and 0.65).

Lastly, turning to the two countries in this sub chapter with the lowest IJI values, the United States and Japan, we see that both countries are performing badly on the net footprint value, with the former having the sixth highest and the latter the seventh highest value in 2015. The United States is also performing equally bad on the child poverty rate, with the fifth highest value at nearly 20 %. Japan is performing better, but its child poverty rate is still slightly higher than the average in 2015. While both countries are performing badly on the debt per child measure, the United States has the fourth highest ratio and Japan has the highest ratio, more than double than that of the United States, and still twice as high compared to that of the country with the second highest ratio, Italy. While the ratio has been rising in the United States over the observational period, the ratio has risen strongly in Japan. Both countries were able to slightly lower their EBiSS value over time, but while Japan's value is lower than the average, the EBiSS in the United States is the fifth highest in the sample. These combinations lead to very low IJI values (between 0.39 and 0.43), the countries being in the group with the lowest five or six IJI values in the sample.

These findings go along with the regime performances in the previous parts of the analysis, as well as the previous research on regime performance. Especially the good performance of the two Scandinavian countries compared to the other four countries in child poverty rates is mirrored in the data shown in Table A.1 in the appendix, which shows the rate of poverty reduction through taxes and transfers for families with children. Denmark and Finland, as part of the social democratic regime are alleviating the biggest part of market poverty through their welfare state and tax system, leading to very low poverty rates among children. Germany's performance is in line with the findings for the average performance of the conservative welfare regime on child poverty. While the United States is performing worst in this small group of countries, the liberal average is also the highest on this measure. It is, however, interesting to remark that while Germany is performing a lot better than the

United States, this does not mirror the regime averages, with the liberal regime performing second best and the conservative regime performing worst.

Some of the indicators are also connected and a similarly good performance will not come as a surprise. The larger spending focus in the Scandinavian countries on families, early childhood interventions, and active labour market policies can all be suspected as factors alleviating poverty among children. A short comparison shows for example that while only 3.4% of the United States' public social expenditure (excl. education spending) falls under the category of family spending, this ratio is 8.9% in Germany, 10.2% in Finland and 11.9% in Denmark. This category includes child benefits, family support, parental leave payments, early childhood education and care (short ECEC) services such as day care and kindergarten, as well as home help services. All these benefits can lift a heavy financial burden of parents' back. A good and inexpensive provision of ECEC for example not only offers children a stimulating environment but also offers parents the opportunity to increase their labour market participation, lowering the risk of poverty.

Chapter 5 – Discussion

I will start this chapter with a discussion on a few findings from chapter 4 and point out further research possibilities on those issues, and then move on to discuss the normative constructs introduced in chapter 2 and assess the findings based on those constructs. The aim is to judge the statistical results on the basis of different constructs or morality and justice, in order to be able to define developments as intergenerationally just or unjust.

5.1 Discussion on Specific Findings

An issue that deserves attention is the strong fall in the EBiSS value in Chile[26]. Looking behind the aggregate value we can see that it is mostly due to stark increases in education and family spending, that the EBiSS fell from 28 in 1995 to 4 in 2015. This expansion led to an increase in the non-elderly spending (excl. health spending) in Chile from around 1 million Chilean Pesos in 1995, to 3 million in 2005, and 11.25 million in 2015.[27] The literature often mentions the transition from dictatorship to

[26] See subchapter 4.4.

[27] It is important to remark that this spending growth was significantly stronger than inflation. Non-elderly spending grew by 12% annually over 20 years (between 1995 and 2015), while inflation had an annual rate of 3.7% during that period (World Bank 2020). This suggests that spending increases on average also translated into more incomes or more services for people and did not just catch up to rising price levels.

democracy as the factor causing the expansion of the welfare state and of social rights in Chile (alongside the expansion of political and civil rights) (Taylor 2004; Waylen 2016). Especially the strong rise in social spending (both non-elderly and elderly) after 2005 are worth looking into, a potential explanation is the election of Michelle Bachelet as the first female president of Chile in 2006 – an important factor for the improvement of family, education, and gender policies? However, scholars are not in agreement how successful or significant these policies were for these developments (Taylor 2004; Waylen 2016). Nevertheless, the data on child poverty and social spending shows that her's and previous centre-left governments were able to get rid of the strong bias in social spending towards elderly people. Further research would be needed to separate the impact of the Bachelet government(s) from a general post-dictatorship trajectory towards welfare state expansion started by the previous centre-left governments.

Another important side note of the data analysis in this thesis was the impact of including age-specific health spending into the EBiSS calculations[28]. The results showed that including health spending increased the EBiSS ratio in the Republic of Korea but decreased the EBiSS value in the Czech Republic and Germany, while it remained relatively unchanged for the Netherlands. These results do not support the aforementioned prediction by Vanhuysse that including health spending would probably increase the EBiSS values. However, the data coverage is still very low and any wide reaching conclusions on the basis of this data should be avoided. More research therefore has to be done in order to include this domain into the EBiSS and to explore further intergenerational issues in health spending.

Furthermore, the data analysis showed that the social democratic regime is on average performing better than the liberal and the conservative regime in the four indicators and therefore also in the joint indicator IJI. With the exception of the 1995 net footprint per person and debt per child ratio, the social democratic regime has the lowest averages for the four main indicators going into the IJI. Depending on the indicator and the year, either the conservative or the liberal regime are performing worst out of the three regimes. This confirms the results from the original study (Vanhuysse 2013) showing that the countries of the social democratic regime on average have the highest IJI values, compared to the two other regime types mentioned here.[29] This conclusion is also supported other research showcasing that countries in the social democratic regime are best at mitigating market forces and their impact on peoples' livelihoods and at reducing the financial burden people have to carry early on in their lives (Chauvel and Schröder 2014; Kersbergen and Vis 2014). The fact that the averages in the regimes are visibly different in most of the data points supports their use in the analysis. However, since the regime

[28] See subchapter 4.4.

[29] It is important to remember that it is assumed that low values on the individual indicators are preferable while a high value on the IJI is preferable.

type methodology is not without criticism, for example for its failure to take unpaid care work into account (Ndunda 2016), I will not focus much more on the welfare regimes in this discussion.

Lastly, I want to remark on some of the findings in subchapter 4.6. The analysis shows that countries with similar demographic parameters show vast differences in their performance. Furthermore, the fitted plots show that demography does not seem to be the main driver behind the performance of different countries. This conclusion was already proposed by previous research (Tepe and Vanhuysse 2009; Vanhuysse 2013) which showed that demographics were neither the strongest explanatory factor for the spending bias nor for the performance on the IJI indicator. I am aware, however, that the analysis in subchapter 4.6 is only superficial due to its descriptive nature and one could pursue the question of the influence of demography by deeper regression analysis. This is not to mean that demography does not play any role in the distribution of public resources between people and generations or in the political sphere. On the contrary, strong arguments can be made for some policy domains in which the electoral power of elderly people plays a strong role, such as the issue of climate change, as argued, for example, by Sustala (2020).

5.2 Theories of Justice in the Four Dimensions

This subchapter uses the theories of intergenerational justice presented in subchapter 2.1 and applies them to the findings from chapter 4. For this aim, I will first offer a short recapitulation of the theoretical discussion to discern the decisive criteria for the assessment. Then I will apply these concepts to the four dimensions. In order to stay in the scope of this thesis I will focus on the arguments by Shue (only applied in the environmental dimension), Wolf (the *Lockean approach*), Dierksmeier (*autonomous freedom*), and for further application, on the social connection model by Young.

Specifically, on the application of intergenerational justice to the issue of climate change, Shue (2014) argues that a generation has the obligation to do their best to fight climate change, all the while ensuring no harm is being done to themselves by their abstinence. He draws this conclusion from the concept of fairness and the principle *to do no harm*. Shue further argues that the responsibility to act should then be distributed according to countries' contribution to the problem and to their ability to fight it.

The Lockean approach, as described by Wolf (1995), can be interpreted under a *harm principle* with distinction between different needs (adventitious and basic) and the moral claims that correspond to those needs. The argument is that if a person cannot satisfy their basic needs because of over-use and over-appropriation of resources by others, the latter are violating the *do no harm* principle. This leads

to a call for sustainable use. Locke focuses clearly on needs, and a complete assessment of intergenerational justice would therefore have to rely on data showing the 'needs level' of people and how this is satisfied. Based on these ideas, one could argue that if it is possible to satisfy the basic needs among contemporaries, the remaining resources – or the condition of having enough resources at one's disposal – have to be preserved for coming generations.

Dierksmeier bases his argument on the Kantian tradition of moral obligations and freedom, he argues that the obligation to guarantee autonomous freedom must be extended to the entire moral community, and that it originates within the individual. He goes beyond the concept of needs and includes the element of autonomy, the ability to "live our lives according to our own designs" (Dierksmeier 2006, 83), as central criterion for the determining when we can speak of a violation of our moral obligations.[30] An assessment following these principles would then describe a situation as unjust if this freedom is not universal, even though it could have been achieved. To offer some context, I believe that an assessment according to these principles would judge any situation as (intergenerationally) unjust in which a country lets a significant part of its children live in poverty, taking away their autonomy to live according to their wishes, while enough resources are available to the society to alleviate at least parts of this poverty.

Lastly, I want to briefly recapitulate the concepts of Iris Young presented above. The social connection model sidesteps the problem of having to find the culprit directly responsible for the harm being done upon others, a process which often seems impossible in our highly interconnected world of complicated structures. It follows, in her argument, that one shares the responsibility for injustice, if one is participating in the structural processes that are causing it. Since the role one individual plays in these processes can be vastly different from that of the next one, Young added the parameters "power, privilege, interest, and collective ability" (Young and Nussbaum 2011, 144) to determine the individual's share in the responsibility. We could take, for instance, the scenario of a country using mostly coal to generate its electricity and heat and thus polluting the environment and contributing to climate change by emitting a large amount of GHG into the atmosphere. The citizens of this country all profit in some way from the electricity generated by this industry, but some people are also suffering from it. If we have established that this mode of energy production violates principles of (intergenerational) justice, how big is the individual's share in the responsibility to change it? Although everyone uses the electricity, an individual in a position of political power ought to have a greater share in the responsibility to change the situation than, for example, an office clerk or mechanic. This argument is based on the notion that the person in a position of political power, naturally has more power to change larger structures than do the individuals working in normal jobs, with only one vote

[30] Similar arguments can be found in the theories of de-Shalit and Sen, also described above in subchapter 2.1.

each in elections. Looking at the parameter of privilege, the logic is that someone who is privileged through the structural processes, for example, through collection of large dividends, ought to have a greater responsibility than an individual who receives a salary from one of the coal extraction plants. Both individuals are 'privileged' by the situation, but the extent of the privilege is vastly different.

The Environmental Dimension

I will start the assessment with the developments in the environmental design and with the arguments by Shue. His notion that the fate of coming generations (meaning what the size of their burden will be, and how much harm they will suffer)[31] rests on how much we do now, can be applied here to obtain a moral obligation for countries to act sustainably. The extent of the consequences of climate change is wide reaching, the human role in it scientifically virtually undisputed, and already the actions of the last 50 years have caused a warming trajectory that cannot be undone even by going down to net neutral emissions.[32] While the latter can no longer be changed, the moral obligation that follows from the former is that countries ought to reduce their emissions to neutral levels in order to prevent further harm, be it by lowering consumption or by increasing biocapacity, or possibly by both. However, this moral obligation only holds when it is possible to pursue this endeavour without harming contemporaries. The closest approximation for this assessment is the measure of the net footprint per person, showing whether a country is consuming over its biocapacity or not.

Looking therefore at the data, we can see that only a handful of countries have a negative net footprint per person, meaning they consume less than their land can produce and absorb. Throughout all five observational snapshots, these countries are Australia, Canada, Estonia, Finland, Latvia, New Zealand, Norway, and Sweden. All other countries in the OECD have a positive net footprint per person (with especially high values found, for example, in Luxembourg, the United States, and Belgium), and the question is, whether it is possible for them to lower their ecological footprint enough so that it falls under the biocapacity (possibly also by increasing the latter). High (income and wealth) inequality in most countries suggests that climate policy does not have to lead to greater poverty, an issue that depends mostly on the political will to effectively redistribute.[33] We therefore have to make a few more assumptions in order to come to a conclusion on this assessment. Firstly, we assume that a country has sufficient resources in order to prevent increases in poverty or deprivation through means

[31] Referring to the basic notions of fairness and not doing harm.
[32] See subchapter 2.2.
[33] While much research has been done on the intersection of climate policy and social justice, especially the essays by Klein (2014, 2019) offer a very accessible take on the issue of how to achieve climate action while promoting social justice.

of pre- or redistribution. Secondly, we assume that this question can be answered in the domain of individual countries, since they still represent the main units of society in which we make collective decisions. Especially this second assumption is strong, but it can be defended by saying that this first assessment only describes whether a country's performance is deemed unjust or not, without stating the extent of the responsibility.[34]

If we believe that these assumptions stand, we can, in this context, only safely claim that countries with a negative net footprint per person are not in violation of the moral obligations laid out by Shue. For all other countries we can simply state that, *ceteris paribus*, a higher net footprint would indicate a stronger violation.

An assessment following the Lockean approach can be viewed in a similar light, especially when taking the net footprint as the decisive measure. Building on Wolf's notion that the Lockean proviso should lead us to "acknowledge our own obligation to avoid harming future generations by using the resources of the earth in unsustainable ways," (Wolf 1995, 810) we can claim that any country with a positive net footprint is in danger of violating these obligations. Again, there are some conditions, namely that the sustainable use does not go against morally superior claims to the resources among contemporaries, for example by people living in poverty nowadays. If we believe the research by climate scientists and economists, then we have to acknowledge that a large share of the resources we claim to are not used for survival and a decent standard of living (Gough 2017), but for what Wolf calls "adventitious needs" (Wolf 1995, 808). For a fully satisfying judgement, we would have to discern therefore, which countries are able to reduce their consumption, while also satisfying the contemporary morally relevant claims to the resources in question. If we assume that the inequality in society hides the fact that actually enough resources are available for everyone, we can expect every country to have some room for improvement. Based on these notions, we would come to a similar judgement as with Shue. Only countries with negative net footprints can claim to not be in violation with their obligations to do no harm and to use sustainably. For the countries with a positive net footprint, it depends on whether we accept the assumption that they have room for improvement while still satisfying the claims of contemporaries. Although, it has to be noted that it is not clear if this room is big enough to reach the threshold of sustainability (in this context a neutral or negative net footprint).

An assessment following the arguments made by Dierksmeier would probably come to a similar conclusion. However, his focus on autonomy and freedom (going beyond the concept needs) makes

[34] It can furthermore be noted that even if we think countries should shoulder different responsibilities due to different size or population density, we are only discussing the extent of the responsibility and not whether it is possible for a country to lower its net footprint at all.

the assessment harder. It is unclear whether detailed data on the needs of human beings and the footprint that comes attached with them can be taken as a reference point for what Dierksmeier talks about. Nevertheless, it becomes clear that in the context of climate justice, some people's freedom has already been violated (and the number is expected to grow over time, when the impact of climate change becomes stronger). According to this approach, a country would violate its obligation to guarantee the conditions for autonomous freedom for everyone, if it adds to the problem of climate change more than necessary to keep up these conditions for contemporaries. If we then again assume that a country is able to lower its consumption while still guaranteeing autonomous freedom for all its citizens, then we can say that, currently, only the countries with a negative net footprint can claim to not be in violation with their obligations on this measure.[35]

I am aware that these assessments leave a lot of questions unanswered, and that they work with a variety of assumptions (some stronger than others). However, to address some of those concerns, I would like to come now to the social connection model proposed by Young. Looking at the previous assessments one could think that it is not 'fair' to judge a country by its net footprint per person, since large countries like Canada and Australia would naturally have an advantage due to their low population density and therefore larger biocapacity per person. However, population density is not the only explanatory factor of the net footprint per person, as can be seen for example in the comparison between the United States and Hungary[36]. Even though population density is probably not the most important factor, we could take it into account when applying the social connection model. Young argued that some structural processes are crossing borders and therefore we have to look at more than just one country in order to determine the responsibility (Young and Nussbaum 2011). Especially the arguments of privilege, power, and collective ability can play an important role. In addition to population density, we can then take into account the economic power of a country, its financial reserves and, for example, its stake in intragovernmental or supranational organisations (such as the EU) in which they can strive for collective action to fight the problem together more effectively. While these things are out of the scope of this analysis, we can still see here that it is possible, with more extensive data to find a more nuanced judgement on how much responsibility a country has to shoulder. Luxembourg, for example, might be in a disadvantageous position due to its small geographical size, but a look at the ecological footprint per person shows that the country also has the highest value in this measure. On the other hand, and this is where the idea of privilege comes in, Luxembourg also has the highest GPD per capita (in PPP current international Dollars) among the OECD nations – around twice as high as that of the United States or Germany (World Bank 2019c). These two

[35] Again, this ability will depend on the inequality in the country and the will to use pre- and redistribution in a way that prevents climate policy from being harmful.

[36] Hungary's population density is at ca. 110 people/km², while it is at 35 people/km² in the US (World Bank 2019f). However, the US has a significantly higher ecological and net footprint than Hungary.

arguments could therefore be weighed against each other. Furthermore, its membership of the European Union (and this argument can be extended to all EU member states), gives it a better opportunity to achieve large scale change together with other member states, referring to what Young called 'collective ability.' We can see therefore, that this assessment is not without its complexities. Concluding on this model, I would like to argue that in absence of sufficient data to perform a detailed assessment, we can say that, *ceteris paribus*, a country with a higher net footprint is in greater violation of its moral obligation. We can, furthermore, say that if the country increased its net footprint per person over time, it increases the probability of being in violation of its moral obligation. The overall long term increase in the measure subsequently constitutes no positive development in terms of intergenerational justice.

To connect the strings from the different assessments and apply the social connection model within a country, I would like to come back to the discussion of inequality. If a society collectively undertakes to lower its negative impact on the climate, it can, according to the assessments presented here, only do so when it makes sure not to harm contemporaries (and destroy the conditions which guarantee freedom and the satisfaction of basic needs for them). Arguing in Young's terms, especially along the lines of power and privilege, it becomes clear that responsibility will lie more with people with substantial economic and political power, than with members of the working class. Income and wealth are highly concentrated in a small portion of society. We can therefore see that there is a small minority of people who are enjoying tremendous privilege from the current situation. Furthermore, in the context of the current political system, this economic power often also gives them more political power (Przeworski 2018). Young's social connection model would then put a greater responsibility on this part of the population. Short of an actual policy recommendation, we can see that further pre- or redistribution could help accommodate this imbalance of responsibility and ensure that climate policy does not harm the contemporaries.

Social Dimension

It is important to note that the interpretation of the results will differ between the indicators, due to the information they give. While the footprint data gives us information about the degree to which different countries are acting sustainably, the child poverty indicator in the social dimension gives information about how many people of a certain age group (the people currently between 0 and 14 years old) are suffering from harm and how many people are potentially not able to exercise their freedom due to this. Furthermore, the statistical nature of this indicator only points us to a discussion about justice within the respective countries.

Some people could argue that an indicator like child poverty should be viewed under the aspect of fairness. Under this light, we could argue that as long as child poverty remains on the same level, no one is worse off. However, this is far from the principles of moral responsibility that we discussed in subchapter 2.1 and will apply in this subchapter. Those discussions go beyond the concept of fairness and focus on whether harm is being done to anyone and whether freedom is guaranteed as a universal condition. However, entertaining this simple idea of fairness, it can be seen as a problem, in this regard, that child poverty increases slightly over the observational period (as shown in subchapter 4.2). On a disaggregated level, this would mean that current children are treated unfairly.

Looking at the Lockean approach, we can first of all state that the criterium of harm is fulfilled since the current distribution of incomes and wealth led to a situation in which a significant part of children, this share being differently sized in the different countries, is not able to satisfy their basic needs. We can therefore see this as a justified claim (to be made by those children in poverty) on the spare resources in the economy[37]. According to the Lockean framework, the only other morally relevant claims competing with those claims by children in poverty, would then come from people of different ages also living in poverty. Under this regard, ignoring the intergenerational element for a moment, anyone appropriating or using resources with a claim based only on 'adventitious needs' in this situation is appropriating or using resources that could have prevented harm and is in violation of their moral responsibility. We could conclude therefore that the persisting inequality, which causes this situation, points to a violation of the moral obligations of the people to do no harm.

How does this issue then become a problem of intergenerational justice and not 'just' an issue with justice overall? The proviso (or its interpretation by Wolf) is not very clear, in this regard, because it mostly speaks about justice between generations that do not live at the same time. This argument is made in order to show how one has a responsibility for the livelihood of people who cannot influence the distribution of resources, for example, by only being born after one's own generation is no longer alive. If we accept this interpretation, then we could extend the idea of intergenerational justice to child poverty. Although children are contemporaries to the other generations currently alive, they are in fact the successive generation to those born before them, and in the years of their life during which we measure child poverty among them, they are not able to influence the distribution and appropriation of resources. In most countries in our data set, children are not allowed to work under the age of 15 and are also not able to take part in politics (International Labour Organization 2017).[38] We are therefore able to interpret this issue under the light of intergenerational justice from the

[37] By 'spare' I am referring to resources that are not currently used to satisfy someone's basic needs and a decent standard of living. These resources can be still part of the common, or more probably be held in possession by someone who does not need them for the abovementioned purpose.

[38] The only OECD countries who have not ratified the *Minimum Age Convention* from 1973 are Australia, New Zealand, and the US (International Labour Organization 2017)

Lockean approach. If we then accept this argument of successive generations, we can make a conditional judgement on the violation of justice through child poverty. A society which lets a share of its children live in poverty would be in violation of their moral obligations to do no harm, under the condition that they have the potential to alleviate this poverty (to an extent) and simultaneously work towards satisfying the morally relevant claims of people over the age of 14. We can expect that inequality in most countries reveals a strong potential for pre- or redistribution that could help with this goal. We would therefore claim to see violations of moral obligations in all the countries in our data, since there is no country with a child poverty rate of zero. The extent of this violation is expected to be strongly correlated to the extent of the child poverty. We could assume therefore a stronger violation in countries like the US (with a child poverty rate of 19.9% in 2015) than in Denmark (with a child poverty rate of 2.9% in 2015).

Following Dierksmeier's approach, one would not necessarily look at the different generations but speak more about the assumption that the moral community, to which this obligation to guarantee autonomous freedom and freedom from harm extends, is not limited by time. Under this light, we see harm being done (even if through structural processes), we can assess that with child poverty rates above zero, and we can assume that the current state of affairs is destroying the conditions for the qualitative and autonomous freedom that we are to preserve for everyone as a general condition. It is important to note that there are probably more factors to the autonomous freedom described by Dierksmeier. We could easily imagine a situation in which a person is not suffering from (severe) material deprivation, but still cannot exercise this freedom, for example, due to restrictions on their mobility or political rights. However, we can make the assumption that it is near impossible to exercise this freedom while living in poverty. We could therefore argue that there is a problem, a violation of the general moral obligation to guarantee this freedom, in all countries with a prevalence of child poverty, where it would be possible to alleviate this problem, at least to a certain extent. Following Dierksmeier's arguments, we could also extend this judgement on the prevalence of poverty among the rest of the population and not necessarily position the two as competing claims. Rather, we can see them both as an indication of failure. Therefore, a country with zero child poverty would not necessarily be free from criticism, but a country with existing child poverty definitely faces a moral problem. Simply speaking, this moral failure to guarantee the conditions for autonomous freedom for children can be observed in all the 36 countries in our data set.

While the statement that a society is in violation of its moral responsibility might seem like a very generalised judgement, applying Young's social connection model can help understand how that responsibility would be distributed within the society. Looking at the individual level, building on the general judgements made in the two previous assessments (both diagnosing the prevalence of injustice), we can use Young's parameters – privilege, power, interest, and collective ability - to

understand how much responsibility an individual would carry. Taking the arguments brought forward in the interpretation on the Lockean approach, we can claim that those who are benefitting greatly from the political and economic system (the 'privileged') have a greater responsibility, than those who gain only little or who are even harmed by it. Related to this, is the parameter of power. An individual with greater political power in the system would have a greater share of the responsibility. I want to make a quick digression here to a point addressed in the assessment of the Lockean approach. I claimed in the text above, that children under 15 can be compared to future generations, as they are unable to affect the situation in any meaningful way. An analysis following the social connection model would probably state that children of that age generally have near to no power in the system and can, therefore, not carry much responsibility. This conclusion would concur with the assessment made above. The third parameter – interest – would work as somewhat of a counter point, since Young states that people suffering from a situation have an interest in changing it and that this interest contributes to their responsibility. It is unclear, however, if this would hold up to a comparison with the argument made about power. Lastly, the parameter of collective ability refers to the possibility to incur change in cooperation with others. The more opportunity a person has to take part in such collective structures and work for change, the greater their share of the responsibility.

Concluding, if we accept the assumption that in all countries there is potential to alleviate existing child poverty, we can state that under both moral constructs, no country can claim to not be in violation of their moral responsibility. The difference is that following Dierksmeier's arguments, a child poverty rate of zero would still not guarantee that the conditions for freedom are upheld for everyone. However, talking just about child poverty, we would come to a similar conclusion under both constructs. Naming just a few examples, we can see that countries in Scandinavia and in Western Europe are performing significantly better than, for instance, Israel, the United States, and countries in Southern Europe. Inequality again plays an important role, both as cause of the problem and as an indicator that it could be solved. In line with Young's social connection model, one could then go into more detail and discern the distribution of responsibility for this situation in the population and confirm the assumption that lowering inequality or increasing pre- and redistribution (from affluent to non-affluent) can help alleviating this situation.

Economic and Fiscal Dimension

Which assumptions do we have to make to be able to assess intergenerational justice in the indicator – debt per child? Or, phrased differently, under which conditions would we describe the level of debt per child as unjust? Acknowledging again that this indicator must be treated with caution, I want to

argue that it is possible to make some claims about intergenerational justice in this dimension. Even though, we cannot see in the data for which purposes the money will be used, I believe that it is clear that high debt levels can lead to harm, for example, when they prevent investments into the future or into other social spending projects. This became clearer after the financial crisis, as some Western nations fell into a debt crisis and many more widened their austerity policies.[39] One important insight to answer this question is the fact that high debt, while also affecting ideas of fairness, can be connected to the other dimensions in this research. High debt levels can prevent sufficient investment against climate change or prevent sufficient spending in the welfare state. This is an argument that would be important both for an assessment along the lines of Locke's proviso and in the context of Dierksmeier's concept of freedom. For the latter, however, we could argue that high debt levels not only indicate potential harm but also a constraint on people's ability to decide freely about their life when they – as a society – are faced with more strongly limited budgets and the legal obligation to repay the debt.[40] I want to, furthermore, point to the argument made by Dierksmeier, that we can derive this moral responsibility without being able to "make out any specific victims" of actions, if we can show that they endanger the general conditions for autonomous freedom (Dierksmeier 2006, 82).

A country with a higher debt per child ratio, *ceteris paribus*, would then be at a higher risk of violating its moral responsibility according to both moral contexts. I would like to state, however, that it is not possible to make a judgement on the individual countries analysed here, due to the nature of the data, which does not show for what the debt was taken on specifically. In order to proceed with this assessment, however, one could conduct further research into the matter by looking more closely at the debt structure and take into account the economic development of the countries.

In addition to the general level of debt per child, the data also shows the trends in this indicator for the individual countries. With no exception, debt per child increased in all the countries in the OECD, however, at different speeds. While the analysis under the viewpoint of purpose of the debt is still deeply complicated, this increase leads countries closer to a point in which they start making trade-offs that can cause harm. Especially Japan, which had by far the highest increase in terms of PPPUSD/child, can be seen as a worrying example of risking violation of the country's moral responsibility. Other cases are Greece and the United States. The former went through the deepest debt crisis in the Eurozone, leading to years of fiscal and social austerity and partly devastating consequences for people's incomes and health (Tyrovolas et al. 2018; Coppola 2018), and in the latter, the budget deficit has been used by Republicans for decades to justify cutting social security and health care (Ghilarducci 2019). Their tactic, which involves increasing the deficit with tax cuts and then calling

[39] See chapter 1, as well as subchapter 2.2 for an elaboration on debt and austerity.
[40] Criticism against this point has mostly come from an argument around the near-zero interest rates which are alleged to make debt less problematic.

for cuts in social programs to reduce the deficit, is often described as “starve the beast” (Ghilarducci 2019) and goes back to the Reagan administration. This combination being doubly problematic, as it results in debt and little pre/redistribution.

Far from a general statement, we can see that at least, in the case of Greece and the United States, the high debt level stands in a clear correlation to harm. I use the words correlation because I do not claim that high debt automatically leads to harm, and I want to point out that in both cases there is a long chain of (mostly political) decisions that led to this situation. Thus, unlike child poverty, a high debt ratio is not a direct cause of harm, but nevertheless we can associate one with the other. I want to use this discussion to point our attention to the social connection model. Along the four parameters, we can, under the assumption that it is possible to improve the government’s budget without entering budgetary trade-offs, make some conclusions, as to which people would carry a relatively large responsibility for the harm associated with high debt levels. There are many more options to improve the budget and lower the debt ratio than to make trade-offs between different policy areas, or even, to cut in important areas like health care and social security. Governments have the power to change tax rates or impose new taxes or, in general, generate revenues from different sources for their budget. We can therefore state, seeing there is potential for change, that the more power an individual has, the bigger its responsibility would be. Similarly, one could claim that those with higher incomes and greater wealth (‘privilege’) would hold a higher responsibility, given that they are benefitting from the current situation. We can see here that it is more difficult to pin-point responsibility than with, child poverty, for example. However, this is not impossible in the individual countries when clearer connections between debt and harm being caused, have been established. Furthermore, we can, based on the assumption that those correlations exist, estimate the share of responsibility of different groups in society as shown in this paragraph.

Elderly Bias in Social Spending

Another difficult undertaking will be the assessment of the EBiSS if we are conducting the judgements under the light of the Lockean proviso, Dierksmeier’s freedom approach, and the social connection model by Young. To remind us of the facts, we are seeing an overall decrease of the EBiSS values from 1995 to 2015. The values are vastly different across countries, with very low values in Iceland, Canada, and some of the Nordics, for example. Very high values can be found in Greece, Italy, Poland, and the United States. It is hard to make a concrete judgement here, because a high EBiSS value does not necessarily have to mean something bad. Since most go through the different phases of life, they will potentially experience the welfare state both as a member of the non-elderly generation and later as

members of the elderly generation. Furthermore, none of the moral constructs applied here have a focus on ideas of fairness. However, I will argue that it is possible to make a wider moral judgement along the lines of the constructs used in this text. For this we have to understand that the EBiSS value, in the context of the constructs we use here, should not necessarily be viewed as a problem itself, as child poverty would. Nevertheless, we can see it as a hint that something might not be right. I want to again take Chile as an example for this discussion. Being the country with the highest EBiSS value (28) in the OECD in 1995, it began to quickly lower that ratio during the observational period, to a relatively low EBiSS value of around 4 in 2015. I have shown in subchapter 5.1 that this is mostly due to a large increase in education and family spending, which drove up non-elderly spending significantly faster than elderly spending, and ultimately changed the share that both had in total public social spending. Due to the poverty reducing effect of sufficient family spending, its absence can have a devastating effect, and a high EBiSS value can be an indicator for that. We see, for example, that the child poverty rate decreased over time.

If the disaggregated data reveals such a situation, then we can argue that the high EBiSS value is indeed an indicator for harm being suffered. In the case of the Lockean approach we would then say that it constitutes an unjust situation, if at least some of it could have been prevented. However, in this scenario it would not be the ratio of the EBiSS itself that constitutes the problem, but the situation it reveals. Applying the idea of autonomous freedom we could possibly argue that not only the lack in sufficient family spending is a problem, but also the inadequate education spending, since education plays a major role in enabling to live according to their own design. In this case, assuming that the situation would have been preventable, we can argue that also under Dierksmeier's moral construct, we would describe the situation as unjust.

Furthermore, I want to entertain, as a scenario, the notion that a very high EBiSS could, in the long term, hurt the society if it means low state spending on families and education, and high spending on pensions. Why should we be worried about this situation? Education still plays a major role in determining an individual's income (Autor 2014), regardless if through human capital generation or credentials, and can help people escape poverty or other harmful circumstances. We also know that it is important for economic development and innovation, ergo benefiting economic development, as shown for example by Hanushek and Wößmann (2015). If we, furthermore, have high pensions and thus high pension contributions that must be paid, we put a larger burden on working people. I do not want to go into too much detail here. However, I hope that the picture I am painting becomes clear, namely, that a high EBiSS can be an indicator of an unsustainable state of affairs. If this is the case, we would have something to object to under both the Lockean approach and Dierksmeier's construct of autonomous freedom.

Lastly, I want to move on to the social connection model. It has become apparent, that it is highly complicated to discern moral failure in this very structural indicator, EBiSS, and I do not intend to make any absolute statements. However, I like to point to one assumption I mentioned in the previous paragraphs, namely the condition 'if the situation could have been prevented'. By this I mean the condition that, for example, following the Lockean approach, a society cannot be in violation of its moral responsibility if the cost of alleviating a harmful condition would cause additional harm elsewhere. If the high EBiSS value raises our suspicion and reveals to us a situation in which harm is being done that could have been prevented, we have to understand who would share the responsibility for that.[41] Looking now to the parameters attached to the social connection model, we would argue that individuals with more wealth and more political power have a greater share of the responsibility. This becomes increasingly clear when we remind ourselves that the EBiSS value does not represent a zero-sum game, as became clear in Chile which increased both domains of spending, just at different speeds. The injustice revealed by a 'suspiciously' high EBiSS value could, in most countries, be either prevented or lessened without cutting spending for elderly people. Policies that increase (or establish) wealth taxes or inheritance taxes, or increase the progressiveness of the income tax system, can generate more government revenue that can be used to prevent injustice (by preventing harm and offering more people a decent standard of living)[42]. This leads us to a conclusion similar to the one in the previous dimensions. We see that many of those scenarios are preventable, and this condition is a big part of the argument that leads us to proclaim them as unjust.

5.3 Inequality and Intergenerational Justice

In the previous subchapter I have argued how we would view the four indicators in the light of the Lockean approach, under Dierksmeier's autonomous freedom and in the context of the social connection model. The results were not always clear, and a different set of assumptions was needed for the different indicators. I want to refrain at this point from a moral analysis of the IJI indicators (be it with an equal or with a climate-heavy weighting), for a number of reasons. First, we are not aware of a threshold level with which to judge the countries' performance on the IJI. This is to mean that unlike, for example, with the net footprint, we cannot claim that a certain level separates a sustainable or un-harmful performance from an unsustainable or harmful performance. Second, it is even harder than with the third and fourth indicator to tie the performance on this indicator to a certain harm or

[41] I want to repeat that it is not possible, under the constructs used here, to describe the level of the EBiSS as a moral failure. Instead this is a general analysis following the assumptions made above.

[42] Of course, this entails a discussion about the trade-off between equity and efficiency and every country has to make sure that these additional revenues are generated and used in a way that does not incur further harm elsewhere.

to situations that undermine the conditions for universal autonomous freedom. It is important to note, that this does not mean that it is impossible to judge the intergenerational justice index through these moral constructs. Under constructs that concentrate on the idea of fairness, we can, for example, look at the development of the indicator and make an assessment based on how the country's performance changes over the years, potentially putting the current youth at a disadvantage compared to the generation before them.

As the final point in this discussion I would like to pick up the references to inequality made in several parts of the previous subchapter. I have argued that inequality of incomes and of wealth can show us whether there is room for improvements, that do not put people into harm's way or infringe on their autonomous freedom. Both measures differ considerably between countries, but we can see a strong prevalence of inequality in all of them.[43] Even though a bivariate correlation analysis between the equally weighted IJI and the Gini coefficient reveals a negative significant correlation ($r = -0.4167$; $p = 0.0197$), I do not intend to go into detail on the characteristics of this relationship – mainly due to the scope of this thesis. However, we can already confirm one of the assumptions from the analyses above. It becomes clear that the conditions we are analysing are not simply a consequence of missing resources and they are not unavoidable. The phrase used above 'under the assumption that it could have been prevented' points exactly to this inequality in income and wealth.

While the conclusions for some indicators pointed to the prevalence of intergenerational injustice, the conclusions from the social connection model already gave hints that this can be viewed in a slightly different light. In the scope of the three main analysis models used in this discussion[44], we can therefore say that we can identify intergenerational injustice to some extent, but that we are also seeing old patterns of injustice in which responsibility moves mostly along the lines of rich and poor. One example for this is child poverty. Regardless of the approach used, the answer was that much of child poverty under current conditions of inequality stands in violation of the moral responsibility of society. Following the social connection model we can argue that the share of the responsibility of children below the age of 15 for this situation is negligible and can be considered irrelevant.[45] The responsibility for this condition, therefore, lies almost entirely with the adult generations. However, this is not where the argument ends. As argued above, people with higher incomes and wealth (privilege), as well as power, will naturally carry a much larger responsibility for the condition.

[43] The unweighted average of the GINI coefficient in OECD member states in 2015 was 0.31 (min = 0.25, max = 0.454) (OECD 2020c). The unweighted average of the wealth share of the top 5% in OECD member states in 2014 was 38.15% (min = 22.96, max = 65.86) (OECD 2020e).
[44] Wolf's Lockean approach, Dierksmeier's autonomous freedom, and Young's social connection model.
[45] I mentioned in my analysis above that children at those ages are not able to work and partake in politics, which means their power is close to zero. Furthermore, one could probably make an argument that children at those ages do not understand the system enough to share responsibility.

Coincidentally, a discussion already quoted in the beginning of the thesis pits both arguments against each other, where the journalist Wolfgang Gründinger and the former head of the German social democrats and former minister of labour and social affairs Franz Müntefering discuss whether the older generations are treating the younger generations unfairly (Gründinger and Müntefering 2020). Gründinger posits, among other things, that it is problematic to have the older generations dominate the sphere of politics and make decisions in their favour – anyone looking at, for example, climate policies, would have a hard time arguing against him. Müntefering on the other hand claims that the biggest lines of injustice still run between rich and poor and points, among other things, to labour rights as one of the main battlefields. I believe that the analysis in this paper finds itself in agreement with both stances. The answer lies both in injustice between generations and social classes.[46]

Chapter 6 – Conclusion

This last part of the thesis I want to use to combine the findings from the analysis and discussion to answer the three research questions formulated at the beginning, point to the main takeaways from the thesis and outline further research pathways.

The first question was "How are OECD countries performing on the Intergenerational Justice Index compared to each other (and over time)?" While subchapter 4.5 showed that for most countries the performance did not change drastically over time, there are large differences between countries. We were also able to observe differences between the welfare regimes, with the social democratic regime performing best, partly thanks to the good performance of Finland, which tops the list in all the different weightings of the IJI, followed by most of the other Nordic countries, the Baltics, as well as Australia, Canada and New Zealand. On the other side of the spectrum, I found countries like Japan, the United States, Greece, and Italy with particularly bad performances on the different IJI weightings.

The second question addresses the developments in the four different dimensions.[47] The analysis showed that over the long run (since the 1960s) biocapacity per person has decreased while the ecological footprint per person increased, but we observed an improvement in the latter after the 1990s. Regarding the net footprint per person, I was able to show that the performance of different countries varies greatly, and that the social democratic regime performed best on this measure as well. The worst performers on this measure were found, for example, in the US, the Benelux countries[48],

[46] The term is used here to refer to the different spheres of income, wealth and social status people find themselves in.
[47] Each subchapter in chapter 4 also contains a final paragraph summarising the results in more detail.
[48] This refers to the Western European countries of Belgium, the Netherlands, and Luxembourg.

Israel and South Korea. Child poverty rates on average increased over the observational period. Again, the countries of the social democratic regime performed best. This confirms previous research mentioned in the thesis, that shows the superiority in poverty reduction in those countries. Furthermore, the debt per child ratios in most countries increased over time. However, special attention was paid to Japan with a strongly increasing debt ratio that is continuously around twice the size of that of the countries following it in the ranking. The analysis also showed a stronger increase in debt rates in some European countries over the time of the Great Recession and the European Debt Crisis. Lastly, the EBiSS value slightly decreased in most countries, with a particularly strong fall in Chile. The analysis has shown that this was mostly due to an increase in family and education spending over the observational period. In both of the latter two dimensions, the social democratic regime performed best.

The third question addresses the relation of the results to the different frameworks of intergenerational justice. Can we speak of injustice and under which conditions? The answer for this depended largely on the different indicators. However, in the context of a Lockean approach and Dierksmeier's construct of autonomous freedom, it is possible to discern clear criteria and distinguish in which countries we can find violations of society's moral obligations. The main assumption used in this thesis, which has to hold for those judgements to be valid, is that there is potential in each country to alleviate at least part of the problem without harming contemporaries.

A discussion along the different moral constructs then shows that only countries with a negative net footprint can claim to be in accordance with their moral obligation in the environmental dimension. This would include, for instance, the Nordic countries (with the exception of Denmark). The second picture offers a more pessimistic picture. The discussion in chapter 5 shows that it is possible to diagnose a moral failure in all 36 societies in the data set, due to the prevalence of child poverty in all of them. The discussion furthermore showed that while the first two dimensions fit particularly well into the constructs of justice presented in this thesis, the debt ratios and the EBiSS indicator are harder to analyse under these constructs. This is due to the statistical nature of the indicators. While the first two indicators are showing clear contributions and direct factors of harm and infringements of freedom, this is harder to define for the debt ratio and the EBiSS indicator.

Regardless of which of the two moral constructs is applied, the additional application of the social connection model by Young shows that it is possible to derive a system with which to assess an individual's moral responsibility (for example, to fight climate change or prevent child poverty), at least to a certain degree. I obtained those results by applying Young's parameters to the results of the data analysis and discerning how responsibility would be distributed.

It is important to note that the data analysis and the discussion also uncovered some points in which more data and a deeper analysis is needed for more comprehensive conclusions. While I cannot cover all those paths in the scope of thesis, I want to point out here some pathways for further research which can offer more explanatory power to the field. One of these issues is the strong improvement in Chile's EBiSS performance. As pointed out in the previous chapter, further research can attempt to distinguish the effect of the Bachelet governments from the general post-dictatorship trajectory. Another issues is health spending. Even though the analysis showed that health spending is not likely to increase the EBiSS values, a further analysis is needed, mainly because the data on age-specific health expenditures is still very limited. Future research on this issue can hopefully rely on an extended database. A last issue in the EBiSS indicator that requires more attention are the suspiciously and continuously high values in some European countries, specifically, Greece, Italy, and Poland.

In the environmental dimension, a needs based emissions analysis could offer some additional insights and can serve as a ground for a deeper moral analysis under the Lockean approach to intergenerational justice, which itself focuses mainly on the different categories of human needs. Having delivered a wider overview of the trends and country performances in the different dimensions and in the IJI, I deem it crucial as a further step to look into the mechanisms behind these developments. Future research in this field can therefore add value by pursuing a regression analysis based on the data laid out here.

As a final point I want to stress, as already argued in the discussion, that the moral failures shown in this thesis do not only refer to a struggle between generations. Throughout the discussion of the different dimensions and moral constructs it becomes clear that the prevalence of injustice, in the case where it was possible to diagnose it, is not God-given, but rather it depends highly on the distribution of resources in society. Growing inequality in OECD countries should then worry us a great deal. As shown above, it is not due to some overwhelming scarcity of resources that we are, for instance, not able to prevent poverty among children or cut back consumption to more sustainable levels in order to slow down climate change, but rather because the resources needed for this purpose are distributed in a highly uneven fashion. It is exactly this argument that shows why we speak – using the Lockean approach and Dierksmeier's autonomous freedom – of a moral failure in the case of child poverty and climate change. It is clearly possible to alleviate some part of the problem without causing further harm or infringing on people's autonomous freedom. How can we approach this?

The social connection model offered some answers. The discussion in chapter 5 showed that responsibility in this construct is, for example, distributed along criteria such as power and privilege, meaning that people with more political power and greater wealth would carry a greater share of the responsibility.

However, even without the application of Young's model it becomes clear that people with particularly high incomes and great wealth will carry a large share of the responsibility to alleviate the injustice we have diagnosed above, mainly because their decision to appropriate resources to that extent prevents society from using those resources to stop harm and preventing infringements on people's autonomous freedom. It is appropriate, therefore, to conclude that we not only find injustice between generations, but that – at a closer look – we can attest to injustice along more classical social and economic hierarchies in our societies (such as income, wealth, etc.). An analysis of intergenerational justice therefore ought not to be undertaken without including concerns of social justice among contemporaries and social classes.

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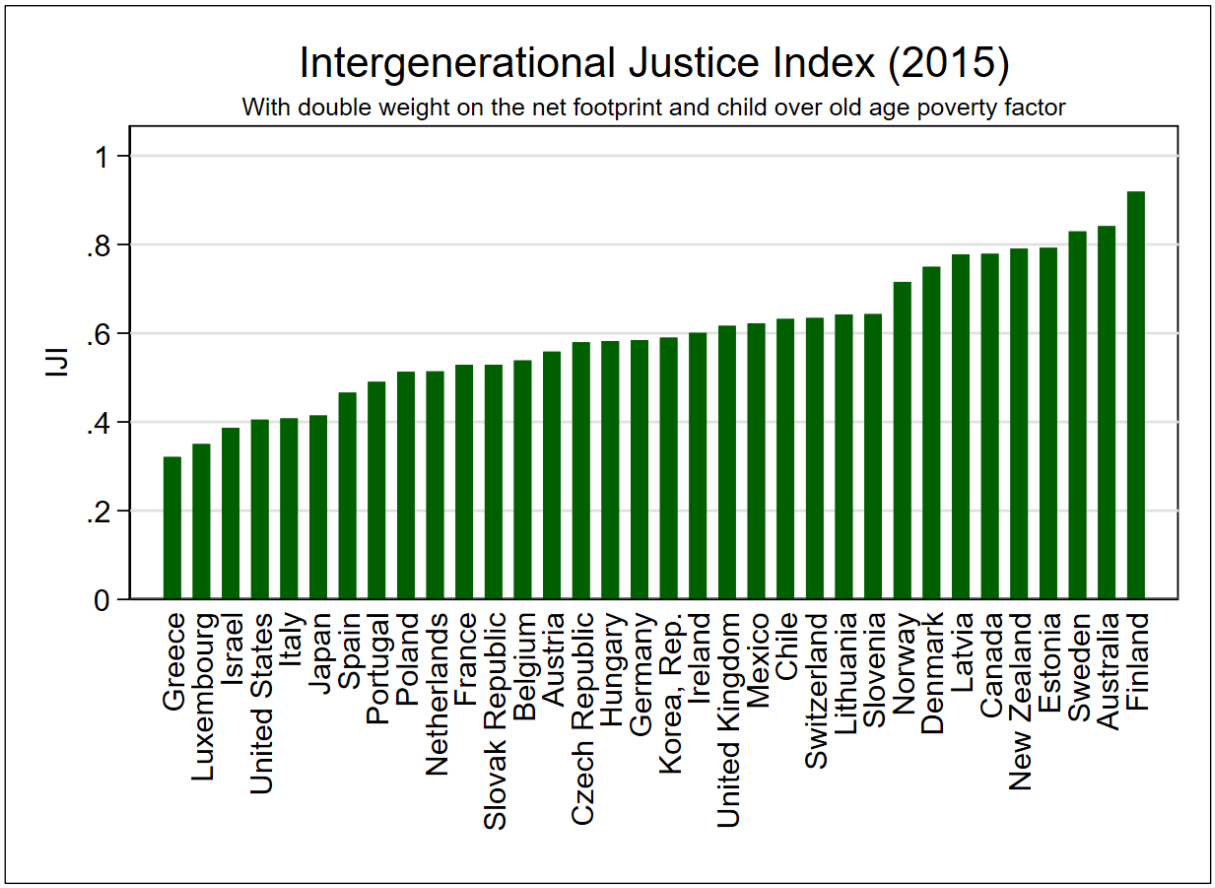
Appendix

Table A.1 – Poverty (< 50% median equivalent income) reduction in families with children, mid-1990s (in percent)

REGIME TYPE	MARKET POVERTY	POST-REDISTRIBUTION POVERTY	REDUCTION OF POVERTY
LIBERAL REGIME	32	19	40
CONSERVATIVE REGIME	33	12	66
SOCIAL DEMOCRATIC REGIME	29	5	84

Source: Table copied from Kersbergen and Vis (2014, 92) and then simplified; liberal regime (Australia, Canada, Ireland, United Kingdom, United States); conservative regime (Belgium, France, Germany, Italy, Netherlands); social democratic regime (Denmark, Finland, Norway, Sweden).

Figure A.1 – Intergenerational Justice Index – climate-heavy weighting – old age poverty factor (2015)



Source: Author's computations

Table A.2 - OECD Member States (at the time this research was started)

#	Country	#	Country
1	Australia	**19**	Korea, Rep.
2	Austria	**20**	Latvia
3	Belgium	**21**	Lithuania
4	Canada	**22**	Luxembourg
5	Chile	**23**	Mexico
6	Czech Republic	**24**	Netherlands
7	Denmark	**25**	New Zealand
8	Estonia	**26**	Norway
9	Finland	**27**	Poland
10	France	**28**	Portugal
11	Germany	**29**	Slovak Republic
12	Greece	**30**	Slovenia
13	Hungary	**31**	Spain
14	Iceland	**32**	Sweden
15	Ireland	**33**	Switzerland
16	Israel	**34**	Turkey
17	Italy	**35**	United Kingdom
18	Japan	**36**	United States

Source: https://www.oecd.org/about/members-and-partners/

Table A.3 – Data on the four indicators (net footprint per person, child poverty rate, debt per child, EBiSS) and the population ratio (While the normal decimal separator in the thesis is the point, here I used the comma as the decimal separator due to the formatting of the data set in the statistical program.)

Country Name	Year	Non Elderly to Elderly Ratio	Net Footprint (gha/person)	Child Poverty Rate, 50% line	Debt per Child (PPP US Dollars per person under 15)	EBiSS
Australia	1995	7,4338	-9,9367	0,1300	31172	4,33
Australia	2000	7,1145	-9,3844	0,1460	25547	5,02
Australia	2005	6,7693	-6,8958	0,1250	18660	4,77
Australia	2010	6,4758	-5,4533	0,1510	44263	4,19
Australia	2015	5,7319	-6,0134	0,1275	93476	3,92
Austria	1995	5,5833	2,2275	0,0730	90587	6,48
Austria	2000	5,4978	2,5358	0,1330	114805	6,66
Austria	2005	5,1739	3,2229	0,0820	149768	6,23
Austria	2010	4,6185	3,2960	0,1000	235422	5,60
Austria	2015	4,3077	3,1310	0,0960	298150	5,53
Belgium	1995	5,2779	6,2380	0,1010	164378	5,73
Belgium	2000	4,9289	6,7120	0,0940	173351	3,93
Belgium	2005	4,7833	6,9178	0,0930	184014	3,99
Belgium	2010	4,7690	6,2523	0,1270	236751	4,00
Belgium	2015	4,5120	5,4739	0,1100	285368	4,04
Canada	1995	7,3648	-9,8813	0,1440	115316	3,71
Canada	2000	6,9586	-8,5244	0,1430	123249	4,08

Canada	2005	6,6234	-7,1719	0,1460	145181	3,96
Canada	2010	6,0653	-7,3177	0,1400	197881	3,60
Canada	2015	5,2291	-7,4055	0,1710	255096	2,89
Chile	1995	13,5994	0,0214	0,2620	4396	27,95
Chile	2000	12,0705	-0,1210		4618	13,34
Chile	2005	10,8568	0,1031	0,2430	3619	10,39
Chile	2010	9,6814	0,5131	0,2305	7033	6,50
Chile	2015	8,4372	0,7792	0,2110	19055	4,09
Czech Republic	1995	6,5655	3,1072	0,0550	10068	5,83
Czech Republic	2000	6,2450	3,0616	0,0720	16802	7,21
Czech Republic	2005	6,1207	3,5291	0,0940	41555	6,44
Czech Republic	2010	5,4766	3,7971	0,1080	72625	6,48
Czech Republic	2015	4,5571	2,9915	0,1050	89065	4,53
Denmark	1995	5,5633	3,7571	0,0200	93115	4,02
Denmark	2000	5,7323	4,0858	0,0240	81266	3,62
Denmark	2005	5,5995	3,9170	0,0280	68221	3,72
Denmark	2010	4,9996	2,8429	0,0370	102098	3,62
Denmark	2015	4,2500	2,7800	0,0290	115809	3,21
Estonia	1995	6,3523	-4,0049		2719	
Estonia	2000	5,6588	-2,8171		2745	6,15
Estonia	2005	4,9683	-1,7216	0,1510	4954	5,65
Estonia	2010	4,7064	-3,0372	0,1240	9349	4,76
Estonia	2015	4,3129	-2,9625	0,1210	17846	4,49
Finland	1995	6,0022	-7,0554	0,0200	56707	4,48
Finland	2000	5,6694	-7,7106	0,0300	62687	5,02
Finland	2005	5,2394	-5,7361	0,0340	73690	4,94
Finland	2010	4,8040	-6,5255	0,0390	110554	4,85
Finland	2015	3,9396	-6,8596	0,0370	163336	3,94
France	1995	5,5962	2,5118	0,0900	59489	6,33
France	2000	5,2277	2,5842	0,0920	81282	5,67
France	2005	5,0709	2,6536	0,0950	111121	5,67
France	2010	4,9340	2,4748	0,1100	165765	5,88
France	2015	4,2963	1,9791	0,1130	212665	5,46
Germany	1995	5,4620	4,2305	0,0800	79427	6,41
Germany	2000	5,0649	3,7717	0,0880	102548	5,74
Germany	2005	4,2999	3,4829	0,1000	148554	5,14
Germany	2010	3,8655	3,6873	0,0910	233988	4,44
Germany	2015	3,7128	3,2607	0,1120	257152	4,39
Greece	1995	5,7635	3,1300	0,1210	90048	15,18
Greece	2000	5,0788	4,6700	0,1220	135849	12,13
Greece	2005	4,5825	4,3186	0,1370	186497	10,39
Greece	2010	4,2214	3,6302	0,1600	273649	10,65
Greece	2015	3,8028	2,6956	0,1890	328570	12,93
Hungary	1995	6,0124	1,1949	0,1030	42635	
Hungary	2000	5,6237	1,5338	0,1310	38813	4,87
Hungary	2005	5,4026	1,7144	0,0870	66290	5,04
Hungary	2010	5,2141	0,9063	0,1210	116383	5,91
Hungary	2015	4,7245	1,0144	0,1060	139743	5,48

Iceland	1995	7,8892			56879	4.45
Iceland	2000	7,6135			47679	3.91
Iceland	2005	7,4684		0,0780	41090	3,60
Iceland	2010	7,3298		0,0780	162606	2,15
Iceland	2015	6,2918		0,0580	156405	2,26
Ireland	1995	8,2097	1,9909	0,1340	61115	3,70
Ireland	2000	8,5025	2,3235	0,1570	50730	3,93
Ireland	2005	8,5118	2,4530	0,1360	52204	3,91
Ireland	2010	8,0827	1,8898	0,1000	179240	3,53
Ireland	2015	6,8179	1,7714	0,1080	242193	3,78
Israel	1995	9,2340	4,8417	0,1450		8,12
Israel	2000	8,9709	5,1978	0,1720	70652	8,33
Israel	2005	8,9765	5,1847	0,2860	78560	6,51
Israel	2010	8,5706	5,2552	0,2850	74657	7,14
Israel	2015	7,9077	5,4875	0,2550	81271	9,01
Italy	1995	5,0380	4,1076	0,1960	173647	12,32
Italy	2000	4,4691	4,5075	0,1270	198362	9,80
Italy	2005	4,0865	4,7103	0,1600	216244	8,99
Italy	2010	3,8955	4,3310	0,1800	287199	8,99
Italy	2015	3,5561	3,5045	0,1830	353327	7,94
Japan	1995	5,9944	4,9774	0,1210	138179	8,50
Japan	2000	4,8877	4,6487	0,1450	250328	8,00
Japan	2005	4,0884	4,4639	0,1420	404745	8,28
Japan	2010	3,4448	4,0927	0,1570	544532	7,34
Japan	2015	2,8433	3,8648	0,1390	720110	5,35
Korea, Rep.	1995	15,7279	4,0432		5165	6,61
Korea, Rep.	2000	12,9156	4,2943		15012	5,25
Korea, Rep.	2005	10,2826	4,7647	0,1060	34648	4,07
Korea, Rep.	2010	8,3516	5,1954	0,0940	58132	3,29
Korea, Rep.	2015	6,7764	5,1864	0,1600	102561	3,03
Latvia	1995	6,2879	-2,7063			8,48
Latvia	2000	5,6718	-1,7712		6630	7,25
Latvia	2005	4,9320	-1,4585	0,1900	10871	4,26
Latvia	2010	4,5010	-2,7405	0,1730	57868	4,95
Latvia	2015	4,1233	-2,3018	0,1220	60297	3,88
Lithuania	1995	7,1371	0,3660			8,10
Lithuania	2000	6,1898	0,3249		9916	5,93
Lithuania	2005	5,2555	1,0678	0,1810	15265	4,86
Lithuania	2010	4,7900	1,0650	0,1590	49312	4,53
Lithuania	2015	4,3517	0,1180	0,1910	84349	4,69
Luxembourg	1995	6,1888	11,8205	0,0790	18353	9,24
Luxembourg	2000	6,1054	13,1822	0,0780	18968	7,13
Luxembourg	2005	5,9345	14,3467	0,1290	27117	5,34
Luxembourg	2010	6,1464	14,0404	0,1130	96084	5,55
Luxembourg	2015	6,1458	11,4552	0,1370	139275	5,95
Mexico	1995	20,2200	0,9266	0,2600	13964	3,40
Mexico	2000	18,4140	1,4172	0,2660	13073	3,21
Mexico	2005	16,7779	1,5422	0,2220	15316	2,90

Mexico	2010	15,2782	1,9197	0,2450	21702	3,93
Mexico	2015	13,8705	1,3997	0,1975	34956	4,75
Netherlands	1995	6,6170	5,2849	0,0970	91981	5,12
Netherlands	2000	6,3626	5,3416	0,0960	87877	4,71
Netherlands	2005	6,0753	5,9363	0,1080	99555	4,22
Netherlands	2010	5,4777	5,7193	0,0960	152447	3,79
Netherlands	2015	4,5803	4,8711	0,1040	194090	3,40
New Zealand	1995	7,6524	-7,1032	0,1270	33346	5,08
New Zealand	2000	7,4628	-6,4465	0,1460	28089	4,01
New Zealand	2005	7,2897	-4,8656	0,1500	24442	4,06
New Zealand	2010	6,6612	-4,8982	0,1500	44828	3,58
New Zealand	2015	5,8273	-4,2676	0,1410	63576	3,18
Norway	1995	5,2463	-1,7192	0,0370	40074	3,34
Norway	2000	5,5546	-2,1925	0,0360	51977	4,01
Norway	2005	5,7499	-2,4111	0,0460	102326	4,13
Norway	2010	5,7171	-0,8653	0,0510	130459	4,20
Norway	2015	5,1338	-1,4886	0,0730	110750	4,37
Poland	1995	8,1353	2,5408		15936	14,96
Poland	2000	7,3168	2,3856	0,1600	19860	14,25
Poland	2005	6,6469	2,4717	0,1780	38851	11,96
Poland	2010	6,4225	2,8265	0,1330	73540	10,70
Poland	2015	5,5794	2,2190	0,1340	92780	9,39
Portugal	1995	5,6609	3,2502	0,1560	47214	7,07
Portugal	2000	5,1469	3,4961	0,1560	59296	6,40
Portugal	2005	4,8126	3,5219	0,1450	99277	6,56
Portugal	2010	4,3583	3,2166	0,1550	165292	6,62
Portugal	2015	3,8165	2,7015	0,1550	271355	7,14
Slovak Republic	1995	8,3225	0,9597		8222	5,88
Slovak Republic	2000	7,8562	1,1447		28595	5,87
Slovak Republic	2005	7,5928	1,8407	0,0970	33700	7,03
Slovak Republic	2010	7,0306	1,9349	0,1220	67115	7,88
Slovak Republic	2015	6,1189	1,4309	0,1480	101543	6,99
Slovenia	1995	7,1349	2,1556		12483	10,19
Slovenia	2000	6,0872	2,4305		33209	7,42
Slovenia	2005	5,4505	3,0708	0,0600	45086	6,23
Slovenia	2010	4,9920	2,8194	0,0960	75751	5,87
Slovenia	2015	4,5515	2,6836	0,0700	178103	5,95
Spain	1995	5,6232	3,5484		60001	6,12
Spain	2000	4,9999	3,8674	0,1870	84711	5,82
Spain	2005	4,9959	4,5028	0,1770	82221	5,28
Spain	2010	4,8637	3,0877	0,2030	129712	4,83
Spain	2015	4,3628	2,6602	0,2210	233417	6,26
Sweden	1995	4,7115	-4,0918	0,0250	83637	3,76
Sweden	2000	4,7791	-4,4746	0,0360	80786	3,74
Sweden	2005	4,7781	-2,1346	0,0400	95954	4,15
Sweden	2010	4,4889	-3,3145	0,0820	97430	3,95
Sweden	2015	4,0998	-3,5670	0,0910	123742	3,10
Switzerland	1995	5,8101	4,4310		87297	5,27

Switzerland	2000	5,5496	4,2964	0,0820	109685	5,45
Switzerland	2005	5,3357	4,4603	0,0940	139718	4,71
Switzerland	2010	4,9202	4,3582	0,0930	149878	4,43
Switzerland	2015	4,5564	3,6984	0,0950	185851	4,09
Turkey	1995	18,1937	0.8484	0.1960		
Turkey	2000	15,4150	1.1253		16153	21.41
Turkey	2005	13,9752	1.2736	0.2460	21101	27.74
Turkey	2010	12,8664	1.6596	0.2740	25983	25.96
Turkey	2015	11,7083	1.8420	0.2530	27671	15.39
United Kingdom	1995	5,2940	4,1885	0,1610	46107	5,05
United Kingdom	2000	5,2920	4,3992	0,1500	51063	5,21
United Kingdom	2005	5,2361	4,8822	0,1380	71916	4,50
United Kingdom	2010	5,0351	4,1177	0,1050	154981	3,87
United Kingdom	2015	4,5635	3,4186	0,1120	210445	4,17
United States	1995	6,8973	5,7640	0,2230	84676	9,49
United States	2000	7,1078	6,3682	0,2130	93287	9,30
United States	2005	7,1223	6,6384	0,2060	138284	7,43
United States	2010	6,7031	5,3024	0,2120	228863	6,85
United States	2015	5,8293	4,5971	0,1990	309334	8,25

Source: The data in this table was compiled and partly computed by the author of this paper, with data from the different data bases used in this thesis:
Bolton (2019), Bundeszentrale für politische Bildung (2019), Eurostat (2020), Global Footprint Network (2019), National Center for Education Statistics (2018b, 2018a), OECD (2020a, 2020b, 2020c, 2020d), OECD Statistics (2019, 2020), World Bank (2019a, 2019b, 2019d, 2019e, 2019g)

Table A.4 – IJI with equal and climate weighting, and each with the child/old age poverty factor, the population ratio (NEE) and the GINI coefficient of post taxes and transfers household income

Country Name	Year	Non Elderly to Elderly Ratio	IJI with equal weighting	… with child/old age poverty factor	IJI with climate weighting	… with child/old age poverty factor	GINI
Australia	1995	7,4338	0,8367		0,8694		
Australia	2000	7,1145	0,8199		0,8560		
Australia	2005	6,7693	0,8418		0,8709		
Australia	2010	6,4758	0,8153	0,8153	0,8348	0,8348	
Australia	2015	5,7319	0,8201	0,8201	0,8413	0,8413	
Austria	1995	5,5833	0,6463		0,6052		
Austria	2000	5,4978	0,5700		0,5504		
Austria	2005	5,1739	0,6439		0,6185		
Austria	2010	4,6185	0,6280	0,6280	0,6030	0,6030	
Austria	2015	4,3077	0,6207	0,5877	0,5848	0,5585	0,2750
Belgium	1995	5,2779	0,4700		0,4273		
Belgium	2000	4,9289	0,5642		0,5087		
Belgium	2005	4,7833	0,6309		0,5738		
Belgium	2010	4,7690	0,6195	0,5919	0,5685	0,5465	
Belgium	2015	4,5120	0,6159	0,5940	0,5561	0,5386	0,2680
Canada	1995	7,3648	0,7037		0,7624		
Canada	2000	6,9586	0,7318		0,7778		

Canada	2005	6,6234	0,7683		0,8146		
Canada	2010	6,0653	0,7967	0,7257	0,8374	0,7806	
Canada	2015	5,2291	0,7585	0,7237	0,8068	0,7789	0,3180
Chile	1995	13,5994	0,3856		0,4169		
Chile	2000	12,0705					
Chile	2005	10,8568	0,5005		0,5328		
Chile	2010	9,6814	0,6048	0,6005	0,6105	0,6071	
Chile	2015	8,4372	0,6598	0,6487	0,6410	0,6322	0,4540
Czech Republic	1995	6,5655	0,7803		0,7044		
Czech Republic	2000	6,2450	0,7181		0,6642		
Czech Republic	2005	6,1207	0,6905		0,6529		
Czech Republic	2010	5,4766	0,6601	0,5395	0,6240	0,5275	
Czech Republic	2015	4,5571	0,7119	0,6123	0,6592	0,5796	0,2580
Denmark	1995	5,5633	0,7047		0,6379		
Denmark	2000	5,7323	0,7696		0,6963		
Denmark	2005	5,5995	0,8082		0,7435		
Denmark	2010	4,9996	0,8257	0,8257	0,7654	0,7654	
Denmark	2015	4,2500	0,8221	0,8221	0,7497	0,7497	0,2630
Estonia	1995	6,3523					
Estonia	2000	5,6588					
Estonia	2005	4,9683	0,7408		0,7420		
Estonia	2010	4,7064	0,8113	0,7314	0,8089	0,7451	
Estonia	2015	4,3129	0,7995	0,7995	0,7925	0,7925	0,3300
Finland	1995	6,0022	0,8781		0,8760		
Finland	2000	5,6694	0,8820		0,8908		
Finland	2005	5,2394	0,8775		0,8887		
Finland	2010	4,8040	0,8878	0,8878	0,9029	0,9029	
Finland	2015	3,9396	0,9061	0,9061	0,9191	0,9191	0,2600
France	1995	5,5962	0,6730		0,6239		
France	2000	5,2277	0,6697		0,6297		
France	2005	5,0709	0,6774		0,6506		
France	2010	4,9340	0,6504	0,5606	0,6286	0,5567	
France	2015	4,2963	0,6493	0,5353	0,6199	0,5287	0,2950
Germany	1995	5,4620	0,6332		0,5763		
Germany	2000	5,0649	0,6366		0,5927		
Germany	2005	4,2999	0,6544		0,6245		
Germany	2010	3,8655	0,6724	0,6724	0,6348	0,6348	
Germany	2015	3,7128	0,6444	0,6218	0,6024	0,5843	0,2930
Greece	1995	5,7635	0,4988		0,4789		
Greece	2000	5,0788	0,4118		0,4049		
Greece	2005	4,5825	0,4401		0,4453		
Greece	2010	4,2214	0,3755	0,3739	0,3978	0,3966	
Greece	2015	3,8028	0,3285	0,2852	0,3557	0,3211	0,3400
Hungary	1995	6,0124					
Hungary	2000	5,6237	0,7038		0,6663		
Hungary	2005	5,4026	0,7414		0,7106		
Hungary	2010	5,2141	0,6798	0,5418	0,6668	0,5564	
Hungary	2015	4,7245	0,6953	0,5895	0,6669	0,5823	0,2840

Ireland	1995	8,2097	0,6578		0,6166		
Ireland	2000	8,5025	0,6769		0,6378		
Ireland	2005	8,5118	0,7254		0,6909		
Ireland	2010	8,0827	0,7404	0,6956	0,7061	0,6703	
Ireland	2015	6,8179	0,6889	0,6226	0,6538	0,6008	0,2980
Israel	1995	9,2340					
Israel	2000	8,9709	0,5090		0,4780		
Israel	2005	8,9765	0,4600		0,4531		
Israel	2010	8,5706	0,4413	0,4413	0,4353	0,4353	
Israel	2015	7,9077	0,4042	0,4042	0,3867	0,3867	0,3600
Italy	1995	5,0380	0,3156		0,3234		
Italy	2000	4,4691	0,3952		0,3931		
Italy	2005	4,0865	0,4334		0,4362		
Italy	2010	3,8955	0,3969	0,3592	0,4084	0,3783	
Italy	2015	3,5561	0,4398	0,4046	0,4362	0,4080	0,3330
Japan	1995	5,9944	0,4743		0,4424		
Japan	2000	4,8877	0,3612		0,3646		
Japan	2005	4,0884	0,3560		0,3766		
Japan	2010	3,4448	0,3589	0,3589	0,3803	0,3803	
Japan	2015	2,8433	0,4176	0,4176	0,4146	0,4146	0,3390
Korea, Rep.	1995	15,7279					
Korea, Rep.	2000	12,9156					
Korea, Rep.	2005	10,2826	0,7340		0,6763		
Korea, Rep.	2010	8,3516	0,7723	0,7723	0,7007	0,7007	
Korea, Rep.	2015	6,7764	0,6545	0,6545	0,5900	0,5900	0,3520
Latvia	1995	6,2879					
Latvia	2000	5,6718					
Latvia	2005	4,9320	0,7347		0,7347		
Latvia	2010	4,5010	0,7297	0,6534	0,7409	0,6798	
Latvia	2015	4,1233	0,7897	0,7897	0,7777	0,7777	0,3460
Lithuania	1995	7,1371					
Lithuania	2000	6,1898					
Lithuania	2005	5,2555	0,6946		0,6791		
Lithuania	2010	4,7900	0,7172	0,6285	0,6952	0,6243	
Lithuania	2015	4,3517	0,6526	0,6526	0,6423	0,6423	0,3720
Luxembourg	1995	6,1888	0,6086		0,4868		
Luxembourg	2000	6,1054	0,5993		0,4794		
Luxembourg	2005	5,9345	0,5702		0,4562		
Luxembourg	2010	6,1464	0,5556	0,4114	0,4445	0,3291	
Luxembourg	2015	6,1458	0,5111	0,4378	0,4089	0,3502	0,3060
Mexico	1995	20,2200	0,6125		0,5901		
Mexico	2000	18,4140	0,6303		0,6085		
Mexico	2005	16,7779	0,7035		0,6818		
Mexico	2010	15,2782	0,6536	0,6536	0,6364	0,6364	
Mexico	2015	13,8705	0,6444	0,6444	0,6222	0,6222	
Netherlands	1995	6,6170	0,5981		0,5386		
Netherlands	2000	6,3626	0,6498		0,5893		
Netherlands	2005	6,0753	0,6739		0,6173		

Netherlands	2010	5,4777	0,7032	0,5404	0,6405	0,5103	
Netherlands	2015	4,5803	0,6789	0,5552	0,6129	0,5140	0,2880
New Zealand	1995	7,6524	0,7965		0,8111		
New Zealand	2000	7,4628	0,8075		0,8200		
New Zealand	2005	7,2897	0,8100		0,8265		
New Zealand	2010	6,6612	0,8302	0,7966	0,8415	0,8146	
New Zealand	2015	5,8273	0,8111	0,7798	0,8156	0,7906	
Norway	1995	5,2463	0,8353		0,7927		
Norway	2000	5,5546	0,8488		0,8153		
Norway	2005	5,7499	0,8319		0,8212		
Norway	2010	5,7171	0,8221	0,8221	0,7972	0,7972	
Norway	2015	5,1338	0,8030	0,7230	0,7796	0,7156	0,2720
Poland	1995	8,1353					
Poland	2000	7,3168	0,4720		0,4733		
Poland	2005	6,6469	0,4707		0,4869		
Poland	2010	6,4225	0,5036	0,4598	0,5078	0,4728	
Poland	2015	5,5794	0,5678	0,5189	0,5522	0,5130	0,2910
Portugal	1995	5,6609	0,6069		0,5643		
Portugal	2000	5,1469	0,6002		0,5660		
Portugal	2005	4,8126	0,6019		0,5821		
Portugal	2010	4,3583	0,5716	0,5226	0,5587	0,5194	
Portugal	2015	3,8165	0,5305	0,4970	0,5173	0,4904	0,3360
Slovak Republic	1995	8,3225					
Slovak Republic	2000	7,8562					
Slovak Republic	2005	7,5928	0,6958		0,6728		
Slovak Republic	2010	7,0306	0,6231	0,5140	0,6119	0,5246	
Slovak Republic	2015	6,1189	0,6195	0,5283	0,6019	0,5289	0,2500
Slovenia	1995	7,1349					
Slovenia	2000	6,0872					
Slovenia	2005	5,4505	0,7323		0,6906		
Slovenia	2010	4,9920	0,7028	0,7028	0,6673	0,6673	
Slovenia	2015	4,5515	0,6876	0,6876	0,6431	0,6431	0,2500
Spain	1995	5,6232					
Spain	2000	4,9999	0,5503		0,5228		
Spain	2005	4,9959	0,6054		0,5758		
Spain	2010	4,8637	0,6017	0,5671	0,5840	0,5563	
Spain	2015	4,3628	0,4936	0,4660	0,4881	0,4661	0,3440
Sweden	1995	4,7115	0,8064		0,7914		
Sweden	2000	4,7791	0,8500		0,8365		
Sweden	2005	4,7781	0,8379		0,8235		
Sweden	2010	4,4889	0,8433	0,8433	0,8372	0,8372	
Sweden	2015	4,0998	0,8377	0,8377	0,8294	0,8294	0,2780
Switzerland	1995	5,8101					
Switzerland	2000	5,5496	0,6361		0,5877		
Switzerland	2005	5,3357	0,6661		0,6247		
Switzerland	2010	4,9202	0,7018	0,7018	0,6521	0,6521	
Switzerland	2015	4,5564	0,6902	0,6902	0,6344	0,6344	0,2960
United Kingdom	1995	5,2940	0,6130		0,5606		

United Kingdom	2000	5,2920	0,6320		0,5834		
United Kingdom	2005	5,2361	0,6666		0,6212		
United Kingdom	2010	5,0351	0,7091	0,7091	0,6602	0,6602	
United Kingdom	2015	4,5635	0,6643	0,6643	0,6167	0,6167	0,3600
United States	1995	6,8973	0,4289		0,3988		
United States	2000	7,1078	0,4079		0,3867		
United States	2005	7,1223	0,4582		0,4382		
United States	2010	6,7031	0,4527	0,4298	0,4440	0,4256	
United States	2015	5,8293	0,4156	0,4156	0,4052	0,4052	0,3900

Source: The data in this table was compiled and partly computed by the author of this paper, with data from the different data bases used in this thesis:
Bolton (2019), Bundeszentrale für politische Bildung (2019), Eurostat (2020), Global Footprint Network (2019), National Center for Education Statistics (2018b, 2018a), OECD (2020a, 2020b, 2020c, 2020d), OECD Statistics (2019, 2020), World Bank (2019a, 2019b, 2019d, 2019e, 2019g)