Intergenerational distributive justice and climate change By Livia Kósa

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Abstract

The thesis discusses our responsibility towards future generations in the context of climate change in a distributive justice framework. The method of the thesis is analytic philosophy – it analyzes normative and empirical arguments about climate change mitigation. Besides the works of philosophers as Derek Parfit, John Rawls, Simon Caney, and Peter Singer, theories of economists who studied climate change, and its effect on the least advantaged, are also studied in the thesis. Three global warming mitigation scenarios are evaluated based on different normative standpoints about intergenerational distributive justice. The thesis argues, relying on the evaluation of the different scenarios, that there is a need for climate change mitigation and the burdens of climate change reduction should be carried by the rich, possibly in a way that today living people benefit from the mitigation policies.

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Introduction

In my thesis, I address the question of what our responsibility towards future generations in the context of climate change is. The question is highly relevant; climate change is a salient issue today, there are many regions that are already strongly affected by the negative externalities of global warming. It is highly probable that the negative effects (e.g. risk of food and water supply) will occur earlier and more significantly in the poorest countries (see: Lee 2014). On one hand, many poor people are living in areas of the Earth that have a high risk of becoming uninhabitable: for example, in areas with risk of desertification, natural disasters, or next to the coast that will get underwater if the sea-level rises. On the other hand, they will probably be less capable of adapting to the changing climate (Tol 2018).

Even if many disciplines analyzed climate change, I think my thesis provides a new perspective. It reconstructs the insights of many theories of more disciplines. I integrated the philosophical ideas coming from the tradition of cosmopolitanism, normative ideas about the just way of the distribution of goods, and the empirical findings of the development economy about the possibilities of emission reduction and about the effect of climate change on the least advantaged. Regarding the method, I followed the tradition of analytical philosophy. I use empirical evidence as well as normative arguments as premises to build my normative conclusion.

Based on different moral theories, I conclude that future people should be considered as right holders, so we do have a special obligation to incorporate their interests in our decision making. I note that we needed to care about future people's well-being to the same extent as we care about our contemporaries, but there are some factors, as the irreversibility of the damage we make, the asymmetric power-relation we are in with our descendants, that creates a special obligation to transfer goods to future people (see Meyer 2016). However, I recognize, that this aim conflicts with the obligation to care about our contemporaries (based on the findings of Schelling 2000). Therefore, in my thesis, I also investigate this trade-off and look for the possibilities to harmonize

the aim of helping the poor today and reduce emission. By comparing three mitigation scenarios, I argue that wealthy people should carry the burden of climate change mitigation because we should not put an extra burden on the poor. I found empirical evidence about the fact that it will be harder for the poor to face the negative effects of climate change compared to the well-off part of the world (see Tol 2018). Based on empirical evidences I state that the burdens of the mitigation policies can be distributed more fairly that the costs of global warming in the future. My main conclusion is that we should care about future people possibly in a way that we simultaneously help today living poor people.

The structure of my thesis is the following. In the first part of my thesis, I will briefly introduce the intergenerational distributive justice problem in a theoretical perspective. First, I define the scope of my inquiry, and describe a hypothetical scenario to that my analysis is restricted. As my analysis is mostly on the abstract level, there is a need for some simplification. After that, I will introduce and evaluate the arguments of John Rawls about the Just Savings Principle then I reconstruct the arguments of Derek Parfit and Peter Singer. Based on the thoughts of Parfit and Singer one does not have any special reason to prefer possible future people over currently living people and vica versa (Parfit 1984 in Meyer 2016). In the second chapter, I critically evaluate the last cosmopolitan argument that suggests time-neutrality. I describe relevant theories about the question of why intergenerational relations are special including the discount rate debate that is present both in economic and philosophical disciplines. I argue (unlike Parfit) that we should not be extremely time impartial. In contrast to that, we do have a special responsibility towards future generations. I base this statement on one hand on the arguments of the irreversibility and asymmetric power-relations i.e. the lack of reciprocity (see Meyer 2016). On the other hand, I base the statement on the disagreement with the knowledge problem and uncertainty arguments and the disagreement with the need for a high discount rate (see Meyer 2016). In the third chapter, I will discover the empirical theories about the compatibility of growth and emission reduction, with a special focus on the differences between rich and poor countries. The empirical findings are relevant from policymaking and normative aspects as well. After this, I enumerate some arguments that say that the poor will be more affected by the negative effects of climate change, moreover they will be less capable to adapt to these negative externalities (see Tol 2018). Based on the empirical findings, I note, that it is easier to distribute the burdens of climate change mitigation than the costs. In the fourth chapter, I will describe three possible scenarios regarding climate change policies. The burdens are shared in the different scenarios in a different way. I will compare them normatively reaching back to the conclusion of the theoretical part, and the work of John Rawls, Peter Singer and Derek Parfit. Besides premises about distributive justice I also consider humanitarian arguments, i.e. whether people enjoy freedom and basic rights in the different scenario. Based on the evaluation, I recognize that the third scenario provides the highest level of justice, in that the burden of climate change mitigation is carried by the rich. I also recognize, that the scenario with no climate change mitigation is the worst because it reduces everyone's well-being very much. However, I note, that some utilitarian could argue for the scenario in that the poor also carries the cost of mitigation. (Those, who want to maximize the aggregated utility.) In the fifth chapter, I continue the empirical enquiry, and look deeper in the trade-off between helping the poor and transferring goods for future people. I will find, - using the results of development economists' studies - that there are some policy areas in that we can harmonize our aim to help the poor people today and also in the future, such as education, technology, nutrition, and digitalization, nevertheless the poor faces some danger almost in all area, if the policy programs are not implemented carefully (see Sachs et al. 2018). I will also write about green bonds briefly, as a tool with that we can postpone the spending for climate change mitigation policies (Gevorkyan et al. 2016). It is a promising direction, but naturally the existence of this possibility does not solve the general question. Altogether, I will find in this part, that we can be positive about the possibilities to fulfil the two different obligation simultaneously (to help people today and in the future). At the same time, there is a need for structural change in our way of life, and policymakers should pay attention for not leaving anyone behind.

Chapter 1 – Theories about intergenerational distributive justice

In the beginning of my thesis, I need to delimit the scope of my inquiry and define a hypothetical framework in that I approach the questions. After this I describe important normative approaches about (intergenerational) distributive justice, that I will analyze and apply in the next chapters of my work.

1. 1. A hypothetical framework, and the necessary limitations of the thesis

There is general agreement among natural scientists that action is required as soon as possible in order to save the Earth from global warming. At the same time, there is no certainty, neither on the exact way global warming will happen, nor on the success and efficiency of the possible hindering actions of climate change. In my thesis, I open only for a limited extent the empirical questions of the effects of climate change, and the probabilities of the possible outcomes. For the sake of simplicity, (i) I assume that it is certain that climate change is caused by human activity, (ii) I assume that it is highly possible that climate change will have serious negative consequences in the future. (iii) I am sure that the poorest regions will face these negative consequences earlier and more seriously than the developed ones because of their lack of resources for capabilities to adapt. (I will find cite supporting evidence for this premise in the empirical parts of my thesis.) (iv) I assume, that there are some policies that are satisfactory to slow global warming, but I am not sure how effective they are, and whether they could stop the process in time (if we applied them now). However, in the fourth chapter in that I compare three scenarios, I assume for the sake of comparability that in those situations, in that no mitigation policies happen, there will be serious damage in the future because of the negative effects of global warming, unlike in those, in that currently living people do try to reduce their carbon-dioxide emission. (v) Throughout history, the rich, developed countries have contributed more to climate change than the poorest ones.

Further limitation of my research is that despite global warming will have a significant effect on nonhuman life as well naturally; for example we could open the question of biodiversity, the intrinsic value of nature including plants, animals; in my thesis, I will focus on the effect of climate change on human life only. I will talk about the nonhuman effect only in instrumental terms, e.g. the damage of plants or the extinction of animals matters only because of their role in human nutrition in my thesis.

The last important initial limitation of this paper is that one could argue that we are harming contemporary people too, if we do not take actions to stop global warming. There is exhaustive empirical evidence, that the negative effects are already visible in our environment (see Tol 2018). In this work, I will disregard this aspect of the question and discuss the issue of the climate change as if we only caused harm to future people while not taking actions against climate change. In that way, we can open less clear and more interesting questions. If we considered that we harm today living people as well, our answer would be much simpler, e.g. there would be less uncertainty regarding our actions, or we should not include debate about the nature of moral relations among people in different generation. This view; analyzing not overlapping generations is called Pure Intergenerational Problem (PIP) in the literature (see for example Gardiner 2006). At the same time, the PIP approach does not mean, that we cannot transfer goods to future people, or that our actions do not have an effect in the future. The main questions of my thesis assume that we can influence the well-being of future people as well as the well-being of our contemporaries.

Regarding intergenerational rights, we will analyze several moral right based theories in this paper, but it is important to highlight, that there are also not right based considerations towards future people according to some scholars (Baier 1981, Meyer 2005 and Thompson 2009 in Meyer 2016). They argue that beside future people's rights vis-à-vis today living people, we can derive obligation for today's people towards future people while considering past and present people's claims as well. An example for these considerations is that as we respect present people's future oriented plans, we should not destroy the conditions and practices that are required to the achievement of those plans (see Baier 1981, Meyer 2005 and Thompson 2009 in Meyer 2016). A different argument is in connection with the inherited goods: we should not destroy the inherited valuable things out of respect towards past people (Baier 1981, Meyer 2005 and Thompson 2009 in Meyer 2016). We should suppose that our predecessors bequeathed those goods not only for us, but also for future generations, so we have to save goods for future people because of the interest of past's and present's people and not (just) because of future people's interest (Baier 1981, Meyer 2005 and Thompson 2009 in Meyer 2016). Naturally these considerations are relevant in the context of climate change as well. One can assume that contemporary people do have certain plans, of which success would be impossible by the effects of global warming. Moreover, the inherited goods argument is even more relevant, since there are plenty of material and non-material heritage that we should protect from the damage of global warming, out of respect for our predecessors in the past. Although, I think these ideas are worth considering, in my thesis I ignore them for the same reason as I have ruled out the concern that climate change is causing harm for today's people too: in order to narrow down the study to the question of whether we must reduce climate change in favor of future people.

1. 2. The theory of Rawls: the just savings principle

In the following, I will present John Rawls's method of decision about the fairness of distributions and his answer to the intergenerational justice question. I will use the essence of his arguments in the next part, to test which mitigation scenarios are the fairest. The two main principle of justice (that concern people living in the same time initially) Rawls (1971) define are: i) each person should have equal rights, and these rights should include at least the basic liberties and ii) there can be inequalities, but only if a) it becomes better for everyone especially for the least advantaged people and b) the positions with benefits and extra income are accessible for all, primarily based on merits (and not luck), so everyone has the opportunity to fill them. These principles are in hierarchy, meaning that you cannot sacrifice universal basic liberties for economic advantage (Rawls 1971). John Rawls wrote only a little about intergenerational justice, he does not have a comprehensive theory, but his views are in accordance with the above mentioned two principles. Rawls (1971, 1999, 1993 and 2001 in Meyer 2016 and Rawls 1971) introduced the Just Savings Principle to describe his view about intergenerational justice. He argues that today's people do have certain obligations towards future people. To elaborate the theory, he introduced the sufficentarian threshold, that refers to a level of conditions that are necessary to maintain a just structure. Rawls (1971, 1999, 1993 and 2001 in Meyer 2016 and Rawls 1971) differentiates between two levels of societal development while defining the Just Savings Principle. His first claim is that people have to establish a just society with just institutions, and as soon as the institutions provide justice, there is no special need for saving individually, it is enough to maintain those institutions (Rawls 1971). His second claim is that people must save for the future people: at least as much as they got from the predecessors (Rawls 1971). If Rawls in his works calculates with constant the number of people over time, this second claim can be regarded as an egalitarian idea. However, Paden (1997) highlights that despite Rawls uses an economic game-theory like thinking to illustrate his principles, the main purpose of saving in his views is to preserve liberty and just institutions. We will consider this principle in evaluation of the different climate change mitigation scenarios. To find a just saving rate, he proposes the use of veil of ignorance method applied to generations (Rawls 1993, 2001 in Meyer 2016 and Rawls 1971). Following Rawls (1993, 2001 in Meyer 2016 and Rawls 1971) the application of the veil of ignorance method to intergenerational problems is the following: the contractors in the original position do not know which generation they will belong to. Therefore, they can decide the fair savings rate. The difficulties of intergenerational justice problems can be ruled out with this method, as the fact that future generations cannot have an effect on previous generations does not matter anymore (that is anyway an important premise we will elaborate on later), because we have to decide from behind the veil of ignorance about the saving rate, where we have no information, about which generation we will belong to. The decided rate will be binding for every generation (for those generations that are before us too) in the hypothetical situation

(Rawls 1993, 2001 in Meyer 2016 and Rawls 1971). It is important to note, that based on the idea of Just Savings Principle of Rawls (1971), one would define a savings rate, that is higher than 100%, because in the decision, one considered that he or she could get into a generation that is in the very distant future. If someone defined a lower than 100% discount rate, he or she would face extreme scarcity if he or she got into a generation, that is in the very distant future. One can see that the veil of ignorance method forces one to maximize his or her well-being in the worst-case scenario. This result properly fits Rawls's first principle in circumstances of justice because it says that the maintenance of basic liberties is the priority. Naturally, the scope of one's rights depends strongly (but not exclusively) on one's financial situation. Regarding the second argument, the difference principle is harder to understand in an intergenerational framework. Paden (1997) suggests that Rawls's difference principle is applicable only within one generation, because it is hard to tell, what kind of institutional arrangement further generations will need to maintain a just society. Paden (1997) interprets Rawls's opinion, as it would be unjust to put disproportionate burden on a generation for the benefit of other future generations.

Following Caney's (2018) argument about the rearrangement of responsibilities and burdens among generations, we have two main distributive justice approaches to normatively evaluate the distributions. The first one is the sufficentarian approach. If we follow this approach, everyone should be kept above a threshold, that is necessary to a decent life. In this case, everyone is compared to a general standard of living. This is very similar to the above described Just Savings Principle introduced by Rawls. At the same time, with this sufficentarian approach, one cannot consider and evaluate the distribution of goods (Caney 2018). Hence, others argue for egalitarianism. With the egalitarian method, we can observe whether the climate change deepens the inequalities or not. Following Caney's (2018) argument, this approach incorporates the sufficentarian principle as well, but additionally, it applies the egalitarian principle. Hence, the sufficentarian principle is higher in the hierarchy: so first we must observe if people are above the threshold and then we can deal with the egalitarian question (Caney 2018). Thus, in this paper, I will follow a Rawlsian distributive justice evaluation technique, so I do not want to maximize equality *per se.* Instead, we will look for scenarios in that one can maximize the universal rights people enjoy, in that people have equal rights, and inequalities are justified as long as they make the well-being of the least advantaged the highest possible, as Rawls (1971) indicated.

1. 3. Theories of Parfit and Singer: the cosmopolitan approach extended to time-impartiality

In the following part, I will shortly compare the arguments of Derek Parfit and Peter Singer about moral relations among contemporaries, and between people in different generations, and build together their arguments to a – non-exhaustive, list of claims that are relevant to our topic. Climate change has several effects today as well, yet, to make it analyzable, as I have said before, I restrict the scope of my analysis on the future harm it causes. In this work, the most important effect of climate change is, that future people will suffer from material loss, and their scope of actions and freedoms will be limited. Probably, the poor will have less capability and possibility to adapt, but the wealthy will suffer loss as well. The important question is whether we can apply the cosmopolitan approach to people who live far from us – not only physical sense but in time. Peter Singer's shallow pond analogy is an illustrative and famous example of cosmopolitan thinking.

The dilemma, in Singer's (1972) analogy, is the following: you see a child, who is drowning in a shallow pond, and you can save him or her with very few material loss (your shoes will get ruined) – and without bringing yourself in danger. It is very intuitive that you have a strong obligation to save him. Singer (1972) argues that this case is analogous to famine relief programs. If you can help people in need with very little material loss, and without endangering your life, you must do it (Singer 1972). According to him, not helping someone who is far from us is identical to the case of not helping someone who needs help near to us, e.g. identical to the case of not saving the drowning child (Singer 1972). His idea in a deconstructed form is the following: i) suffering is bad, ii) if we can stop something bad, we should, therefore we should stop suffering if we can. Furthermore, the distance of the person we help, does not matter, and the fact that others can help too, does not matter neither – says Singer (1972). We should try to extend the shallow pond analogy to the context of climate change: to different - not overlapping – generations (as Schelling (2000) also did). Applying Singer's view, we can say that the distance in space and time should not influence us, in considering whether we must stop the suffering of someone. We do have obligations towards people who need help in the distant future, such as we do have obligations to people who need our help in other countries (today). Schelling (2000) also invoked cosmopolitanism in discussing the question of intergenerational justice. He also argued that transferring goods to future people instead of other today's people is a similar decision to transfer goods to other continents instead of helping people from your culture (Schelling 2000).

In the following, I introduce Derek Parfit's views, who has arguments specifically about intergenerational moral rights. Unlike Singer, he directly talks about one's obligation towards people in different times (Parfit 1984 in Meyer 2016). He introduced the no-difference view, that implies that i) all things equal, we do not have a special reason to prefer possible future people over currently living people and vica versa. He prescribes no special obligation for present people to act considering the size and composition of future generations. ii) Just like Singer, he argues that all people have the moral obligation to prevent harm if that is possible: both harm against future people and harm against today living people (Parfit 1984 in Meyer 2016). Furthermore, Parfit (1984 in Meyer 2016) sees no difference between causing harm to someone who enjoys a higher level of well-being and causing harm to someone, who has a smaller level of well-being. This approach is a utilitarian view, that implies that the same amount of utility increase carries the same value independently from the fact that it went to the wealthy or the poor. This is in contrast with the ethical idea of prioritarianism, which means that the same amount of utility has more social value if that goes to a poorer person than if it had gone to a richer one (Broome 2008, p 99). To sum up his thoughts, we should be neutral regarding the time period people live in, and neutral regarding the relativity of utility-loss people suffer because of our harm. This kind of utilitarianism is an alternative to Rawls's distributive justice theory (Rawls 1971), as he argued for improving the state

of the least advantaged is (after securing everyone the basic rights). Rawls's idea is closer to a prioritarian view. At the same time, it is common in Rawls's and Parfit's work that none of them prescribed us the special obligation of improving the living conditions of future people. However, Rawls's Just Savings Principle is more demanding regarding our obligations towards future people, based on the obligation to maintain just institutions and to follow a just discount rate (that should be higher than 100%). Note again, that based on the idea of Just Savings Principle of Rawls (1971), one would define a savings rate, that is higher than 100 %, because another way, one would face the difficulty of poverty if he or she would get into a generation that is in the distant future.

At the same time, Parfit's and Singer's work are more in accordance with each other: Singer argues, that we must stop other people's suffering if we can, may that happen to people in other parts of the world - based on the premises, that i) suffering is bad, ii) if we can stop something bad, we should (Singer 1972). According to Parfit i) we do not have a special reason to prefer possible future people over currently living people, and vica versa, and ii) all people have the moral obligation to prevent harm if that is possible (Parfit 1984 in Meyer 2016). Singer's conclusion is very similar to Parfit's second premise, respectively, we should stop other's suffering if we can, and all people have the moral obligation to prevent harm and avoid harmful acts if that is possible. I continue with this argument in this paper. Parfit's proposed time neutrality follows a similar logic to Singer's cosmopolitan spatial neutrality (Parfit 1984 in Meyer 2016). The argument I would like to take a deeper look in the next parts of my thesis is Parfit's first claim: we do not have a special reason to prefer possible future people over currently living people and vica versa. This argument can be divided into two parts:

- i) one does not have any special reason to prefer possible future people over currently living people and
- ii) one does not have any special reason to prefer currently living people over future people.

Chapter 2 – The evaluation of theories about intergenerational justice

In the following part, I will collect empirical and normative theories and arguments that help us to answer the question of what obligation do we owe towards future people. At the end of this chapter, I attempt to critically evaluate the arguments about time-impartiality that I highlighted and reconstructed in the previous part, based on the theories of Peter Singer and Derek Parfit.

1. 1. Debate of discounting

The fact that the average well-being is increasing, and the possible targets of our savings live in the distant future makes the responsibility question to reduce the climate change even more difficult to answer (Broome 2008). There is a traditional economic consideration, that the later we can access some goods, the more we must discount the value of those goods, i.e. the later people live in the future, the more we should discount the goods they access. Naturally, this idea has serious implications on the intergenerational distribution of goods. Moreover, there are also philosophical consideration that propose discounting. In the following, possible supporting arguments for discounting are enumerated.

- (i) There is a clearly empirical premise: future people will have a better life, and higher well-being than present ones. Therefore, we must discount future people's well-being based on egalitarian ground (Broome 2008). Naturally, this premise does not consider the effects of global warming. Because of global warming, the growth will be probably slowed down.
- (ii) The next one is the ethical idea of prioritarianism that is strongly connected to the first normative premise: the same amount of utility has more social value if that goes to a poorer person than if it had gone to a richer one (Broome 2008, p 99), as presented before. This idea was followed by Parfit as well. Utilitarianism defines a lower, while prioritarianism defines a higher discount rate to compare futures people's benefits with

today's people's benefits. Based on prioritarianism, if we consider that future people will have a better life than today's people, we could conclude that there is no obligation to control our consumption and we should save goods for future people.

- (iii) The second empirical premise is the following: humankind could extinct because of some unprecedented event. Thus, the further we are in the future, the more probable the extinction is. This has a very low probability, but it makes it reasonable to weight future people's well-being lower than ours according to economists, such as Stern (2006) or Nordhaus (2007).
- (iv) A third empirical premise says that in the long-term, money loses its value. Nordhaus (2007) calculates with a 6% discount rate of consumption. Moreover, he highlights, that in the field of development policies, the return of the invested capital is outstanding So, one could argue even for 30-40% discounting of future people's goods because some development policies are so successful (Nordhaus 2007).
- (v) The last assumption is a second normative premise, the pure rate of social time preference. According to this argument, future people's well-being should be discounted in our policy decisions compared to today living people only because they live in the future (Nordhaus 2007). This is a normative premise, but it is also used in economic calculations.

Among these considerations, we will focus on the "pure time preference" (v) and on the assumption that future people will have better well-being (i-ii). The probability of extinction is very low therefore I will not concentrate on the third premise in this paper. Even economists calculate with a near-zero probability of extinction (see Nordhaus 2007). The low likelihood of extinction would be much more relevant if we compared the well-being of people in very-distant time to ours because in that case, one should multiply the probability of extinction with the number of years. Albeit, in this paper I analyze the relationship between people who live today and people who live in the future, the time frame is theoretically limited to a foreseeable horizon.

There is a general disagreement about the method of the discount rate calculation and about its exact extent (Caney 2014). One approach is the descriptive approach, in which you can define the discount rate based on empirical observations, and the other approach is the prescriptive approach, in which besides the empirical observations, you use a normative judgement too to prescribe the necessary discount rate (Caney 2014). At the same time, I do not think that one can define a discount rate objectively, even economists agree that there is no objective truth about the discount rate. They also involve normative premises about the well-being of current and future generations. The most ambiguous point is the pure time preference - we discriminate against someone, who lives in the future. A high discounting rate has the policy implication that we give less value to the money that is "spend by" future people i.e. saved for them or invested in future-oriented projects (Broome 2008). Or in more general terms, we care less about future people's well-being compared to ours (Broome 2008). Therefore, it implies that we will care less about climate change reduction. Even economists have conflicting views about the extent of discount rate, especially including the fact of climate change into our calculation. Some theorists (Nordhaus 1994 in Broome 2008) define a high discount rate. From high discount rate follows that there is no need for the immediate introduction of global warming mitigation policies. Stern and other economists disagree with Nordhaus (see Nordhaus 1994, Stern 2007 in Broome 2008, and Stern 2007). He defines a lower discount rate, so he supports immediate action against climate change (Nordhaus 1994, Stern 2007 in Broome 2008, and Stern 2007). Those who argue for a lower discount rate are more neutral regarding generations, therefore they advocate for immediate action. Stern (2007) argues that the earlier we act, the less costly it will be to reduce the negative effect of climate change. Moreover, according to Stern (2007), some environment protection policies (e.g. reusing, recycling, public transport) might improve communities and get people closer to each other. We will come back to policies that simultaneously help the poor and help to stop global warming (in Chapter 3-4). Nonetheless, Nordhaus (1994 in Broome 2008) also agrees with the fact that there will be a need for climate change reduction, he just thinks that Stern is ahead of his time (see Nordhaus 1994,

Stern 2007 in Broome 2008, and Stern 2007). Broome (2008) highlights that those who support equality can easily accommodate this idea, as it is hard to subscribe an obligation to the poor (today living people) to help the rich (future people). We will come back to this consideration and criticize with the "separateness of generations" premise: one should assume that there will be poor people in the future as well, so, one should not discriminate neither current not future people (Schelling 2000).

The idea of discounting is criticized from the economic approach as described before (see Nordhaus 1994 and Stern 2007 in Broome 2008 and Stern 2007). Moreover, Broome (2008) mentions that some economists argue it is not right to draw an economic (empirical) conclusion from ethical, normative premises. So, they claim, it is not right to involve the prioritarianism claim when determining the possible discount rate (Broome 2008). At the same time, even without the idea of prioritarianism, one could argue for a high discount rate from an economic perspective, based on the arguments, enumerated before. We can see that even economic theories involve philosophy. To make a further investigation about the criticism of discount rare, in the following I present some important philosophical literature, mainly that argue for time-neutrality.

Schelling (2000) in his paper *Intergenerational and International Discounting* aims to criticize the main argument of those economists, who claim that future consumption should be discounted. He highlights (that we already discussed) that the two main arguments of those economists who stand for discounting are time preference and declining marginal utility. He states that the pure time preference argument is not satisfactory, because a decision to invest in the future or save for the future (i.e. reduce greenhouse gas emission) is not a saving decision, but rather a decision about redistribution (Schelling 2000). The other main argument that he criticizes is the decreasing marginal utility. Those who claim that there is need for discount, they claim that because the consumption per capita will rise over time, the marginal utility of consumption is declining too. Schelling (2000) goes against this idea, claiming that the transfer goes from currently rich people

to the descendants of the currently poor people, who will be probably poorer than present-day rich people. We will come back to the empirical analysis of these crucial claims. At the same time, he refers to the complication that if we choose to invest into greenhouse gas reduction in favor of the descendants of today's poor people, instead of helping poor people today we decide in the name of other people in developing world (Schelling 2000). I will criticize this statement later. Schelling (2000) highlights that our choice may be in contrast with the preference of today living poor people, but he does not take a clear position on this moral question. I call this consideration the "separateness of generation" in my thesis, referring to the evidence that every generation consist numerous social classes. For the sake of simplicity, I refer to these groups of people as rich and poor people, yet I know that one could differentiate hundreds of social groups. This "separateness of generations" is also relevant if we talk about pure time preference and discrimination of people because of their time period.

The idea of pure discounting (which means that just because of the distance of people who live in the future, we should consider their claims less than of those who live today) is widely criticized not only by economists, but also by philosophers (Broome 2000). As enumerated before, many philosophers propose temporal impartiality (such as Parfit or Schelling). Caney (2014) in his work *Climate change, intergenerational equity and the social discount rate* mentions further arguments against the application of discount rate. He also argues for moral equality, i.e. one should not consider in normative questions someone's location in time – one cannot put more or less burden to someone, who lives in a different time period. This is the same argument as Parfit's and Schelling's. Caney (2014) also agrees, that giving extra burdens to someone because he or she lives later, would be analogous with other kind of discriminations (e.g. racism) that are unjust as well. Moreover, Caney (2014) highlights an additional important argument against discount rate, the *best use argument*. This means that the usage of the discount rate is likely to lead to suboptimal use of some resources. Caney (2014) uses Derek Parfit's (1984) example to illustrate a contradiction: there are two policies – policy A helps to avoid a smaller catastrophe, policy B helps to avoid a bigger catastrophe, but it

is later in time, the two policies cost the same amount of money. If we used the discount rate, we could not use policy B, even if it could avert the more significant catastrophe – following Parfit's argument in Caney's (2014) work. It is important to note, that in context of climate change and greenhouse gas emission, negative surprising events have more probability to occur, that positive ones, i.e. it is hard to imagine that at one point everyone switches to renewable energy sources (Nakicenovic and Swart 2001, van Vuuren et al. 2011 and Clarke et al. 2014 in Tol 2018).

Parfit and Cowen (1992) also highlight that there is also a probabilistic discount rate. As we cannot predict the future, the temporal and the probabilistic discount rate usually correlate for some extent, at the same time, according to them, we should discount rather for probability than for time (Cowen 1992 and Cowen and Parfit 1992). As I have mentioned earlier, the probabilistic discount rate might be relevant if we consider extinction, however, this is rather important in the very distant future. In my thesis I rather focus on the near future, where extinction has near-zero probability, at the same time people face the negative, even catastrophic effects of climate change.

1. 2. Debate of relations among people in different time

Besides the discount rate, there are many other valuable economic and ethical considerations that shape the discourse of intergenerational neutrality. Based on the next arguments, we can shape our view about the need for discounting as well as about intergenerational relations in general. The first question of intergenerational justice is whether future generations can be regarded as claim or right holders against today's generations. If the answer to this question is yes, that can imply that present generations have to avoid policies that would cause an unjust intergenerational distribution of goods or those policies that harm future generations. Based on Meyer (2016), theorists also deal with the issue of our obligations towards past generations within the question of intergenerational justice, but it is irrelevant for the topic of climate change, as the climate change is not affecting directly the past generations, though there are considerations about the future plans of past people. I rule out these questions, as stated earlier. Therefore, in the following I will investigate the question, why are intergenerational relations special. Scholars agree that intergenerational relations are different from relations among contemporaries in many aspects.

Barry (1977 and 1989 in Meyer 2016) argues that one important difference between relations between people who live in the same period and those who live in different times is that there is a lack of reciprocity among people from different periods of times, so their power-relations are asymmetric. Those who live in the future cannot react to the actions of contemporary people, and they cannot repay the benefits or burdens they got from contemporary people as naturally, they cannot influence the presently living people in any way. At the same time, following Barry's (1977 and 1989 in Meyer 2016) argumentation, today's people can harm future people, they can influence the possibilities and therefore the preferences of other people, living later than them. The most extreme manifestation of this power is the possibility of today's people to decide about the very existence of future people (Hart 1955, 1982, Wellman 1995 and Steiner 1994 in Meyer 2016). The simplest example of this power is that people can freely decide about the number of children they want (not considering their upper biological limits). They raise the example that we can decide not only the number of our children but through policies and other individual actions we can also have a general influence on who will be conceived in the future (Hart 1955, 1982, Wellman 1995 and Steiner 1994 in Meyer 2016). In contrast to that, we cannot decide about the very existence of the contemporaries, only about the survival of those (Hart 1955, 1982, Wellman 1995 and Steiner 1994 in Meyer 2016). This makes the intergenerational question more complicated: how should we relate to those people who do not exist at all, can we harm them, do we have an obligation to them?

2. 2. 1. Will Theory versus Interest Theory of Rights

Some scholars claim that no moral questions can be formulated about intergenerational rights at all. According to the Will Theory of Rights, only in those cases can someone hold any right against other ones, if the one is able to exercise his or her right over others, i.e. if you are a right holder, you have a special claim against others, you are a "small sovereign in certain matters" (Hart 1982 in Wenar 2015). Thus, those people who live in different periods of times, cannot hold or claim rights against each other, so there is no need to consider the rights of future people from the perspective of justice according to the Will Theory. In contrast to that, the Interest Theory of Rights indicates that one can hold rights against other people even if he or she is not in the position of harming or helping the other person (Raz 1984, 1986, 1994, Barry 1989 and Buchanan 1990 in Mayer 2016). I think that our obligation regarding the very existence of future people would be only analyzable on the metaphysical level. To bring satisfactory arguments that support the claim that the existence of future people is in itself intrinsically valuable, or that we have to maintain the existence of mankind is out of the scope of this thesis. However, I think that we do have certain obligations towards future people, as there is a high probability that there will be generations of people in the future, to them we are required to provide freedoms and rights. I am agreeing with the Interest Theory of Rights and not with the Will Theory of Rights, because even if we do not meet those people living in the future, our actions will have a certain effect on their life.

2. 2. 2. The knowledge problem – uncertainty

Another important feature of intergenerational relations is that our knowledge about the future is very limited. We do not know exactly the long-term effects of our policies, so it is hard to assign exact probabilities to right violations in the future (McCarthy 1997, Oberdiek 2012 and Perry 2014 in Mayer 2016). Hulme (2011 in Lee 2014) is quite radical about the knowledge problem: he argues that one should just ignore those arguments which say that climate change is not a real issue, and it is not harmful at all. He claims that there is prima facie evidence that climate change is harmful, so those who are not convinced of this fact have to come up with counter-evidences. Hulme (2011 in Lee 2014) argues there is no burden of proof on those who claim that the climate change is harmful, even if the level of global warming and climate change is uncertain. I tend to agree with the idea of the inverted burden of proof in case of limiting policies which are likely to cause harm. Naturally, one should not be overly cautious either and overly restrict every activity that has a slight

possibility of being dangerous. But climate change is different: we should believe in scientific evidence, as scientist have evidence about the dangers of global warming.

At the same time, because of the level of some uncertainty, it is especially hard to decide about the extent of consideration of future people's rights if the interest of future people conflicts with today's people's interests. Schelling (2000) also highlights this problem in terms of greenhouse gas reduction: it is hard to decide if we should reduce greenhouse gas emission in order to save the Earth for future people or we are rather morally obligated to help poor people (today). In this case, if we consider that we do not know exactly the effect of our emission reduction policies, at the same time, we know that there are deprived people with needs, it is hard to conclude, that we are morally right if we prefer future people's preferences over today's people's preferences. I will look into this trade-off more deeply in the last chapter om my thesis. Caney (2018) also recognizes the problem of opportunity costs resulting from the knowledge problem. He says that policies tailored to combat climate change have in every case significant opportunity cost, that we should consider. He differentiates between three methodological approaches of this question. The three types of evaluation are integrationism, moderate integrationism, and isolationism (Caney 2018). Isolationism means that we should evaluate the distribution of goods disregarding other considerations for example the distribution of other goods. Caney (2018) highlights that many philosophers take an isolationist approach in climate policy questions. Moderate isolationism means that we should not disregard other considerations while answering one question but consider them. However, there should be one main general principle, just as in the case of isolationism, that rules our evaluation, the other factors just shape our understanding of special cases (Caney 2018). These additional principles could lead to making exceptions, and not following the main rule in certain cases (Caney 2018). The third approach is, following Caney (2018), the strong integrationism. That way of thinking holds that we should consider every possible benefit and burden, not only one kind of good, and apply a general norm in our evaluation of the distribution of goods, says Caney (2018). So, here, we should not put aside other concerns, for example, humanitarian effects caused by putting burdens on certain groups of people. I think in this paper we cannot disregard the opportunity cost of the money and time we spend on climate change policies. If they were not in a conflict with currently living people's interests, the whole question of this thesis would be not so relevant because there would be no conflicting strategies of distribution. In contrast to that, I recognize (agreeing with Schelling (2000)) that there is a serious trade-off between helping poor people today or helping poor people in the future.

2. 2. 3. Non-reciprocal harm

As I highlighted earlier, the power relations between different generations are asymmetric. This is especially relevant if an act of harm happens, I think. Broome (2008) says that the most important consideration when deciding our actions should be the prohibition of harm. (i) We should not cause harm to other people for our own sake. This idea is identical both with Parfit's and Rawls's theory about justice. (ii) Broome (2008) argues that on the one hand each of us are contributing to greenhouse gas emission, and greenhouse gas emission is causing climate change. (iii) On the other hand, climate change is causing harm to people while causing natural disasters, shortage of food, and water. According to Broome (2012 in Nordhaus 2014) there are seven conditions that indicate that you have a moral duty to compensate someone: "you harm the person; you are responsible for the act; the harms are serious; it is not accidental; the act benefits you; there is no reciprocal benefit; and restituting actions are inexpensive." (Broome 2012 in Nordhaus 2014: 1136) Greenhouse gas emission is meeting all the above-mentioned conditions (Broome 2012 in Nordhaus 2014). From three premises – one normative and two empirical, he concludes that we are harming other people if we do not take actions to stop climate change. Therefore, we have to stop emitting greenhouse gases (at least try not to emit) and we should compensate those people who are harmed by the effects of climate change (Broome 2012 in Nordhaus 2014). He also emphasizes that this issue cannot be solved only with a utilitarian comparison of costs and benefits (Broome 2012 in Nordhaus 2014). As I have mentioned earlier, he criticizes the discount rate idea as well (Broome 2012 in Nordhaus 2014).

Lawford-Smith (2016) highlights that according to Broome harm is only in those cases unjust when it is not reciprocal. She claims that as the poor are suffering from the harm of global warming, and the rich people are not suffering, only the emission of the rich is unjust. At the same time, the emission of the poor is harming too, but it is not unjust because it is reciprocal (Lawford-Smith 2016). I think this view might be misleading because even if the rich suffer from negative consequences, they might have more responsibility to slow global warming, based on the capabilities they have. However, Lawford-Smith (2016) has a special view about the scope of responsibilities. She highlights the difference between doing or failing to do something. According to her, it is not the same level of injustice not to send money to the poor who are harmed by climate change and omitting greenhouse gas. So, he takes an anti-utilitarian approach. The main difference is that omitting greenhouse gas is an action we choose to take actively so that is different from failing to prevent harm, therefore it is more serious (Lawford-Smith 2016). But I think it is hard to delimit the scope of actions that belong to one's responsibilities. It is hard to say that in case of every act we do we are aware of the quantity of carbon-dioxide emission it causes. At the same time, I think that if we are aware that people are or will be in need (as Singer described in the shallow pond analogy), we do have responsibility to actively stop something bad happening.

2. 2. 4. The irreversibility of global warming

Gardiner (2006) in his work *A Perfect Moral Storm: Climate Change, Intergenerational Ethics and the Problem of Moral Corruption* applies a game theory perspective to elaborate on the difficulty of the intergenerational question. He highlights that people do not pay attention to the fact that an emitted CO_2 molecule remains in the atmosphere for hundred or even more years (Archer 2005 in Gardiner 2006). This empirical fact - among other factors – means that climate change is irreversible, and we are facing the harms caused by people in the past and some of the harm we cause will have an effect many decades later. Naturally, there are some consequences of global warming that we can mitigate in the presence, at the same time in my thesis I have the hypothetical assumption that climate change happens in the future. Gardiner (2006) argues that based on these facts, the temporally fragmented agents cannot cooperate, cannot be unified, so they cannot react to the problem as a single agent. Gardiner (2006) applies the Prisoner's Dilemma to not overlapping generations (Pure Intergenerational Problem), he says that collectively it is rational to cooperate, but individually - generation by generation – it is rational not to cooperate, even if other generational ocooperate, like in the original model of the Prisoner's Dilemma. The Pure Intergenerational Problem is more difficult – following Gardiener (2006) - than the standard game theory situation, because if the first generation did not comply, i.e. pollutes too much, the second generation has less reason to change its behavior, furthermore the problem become more and more serious, as the emitted greenhouse gas is not eliminable, the infrastructures become more and more specialized to the use of fossil fuel. Therefore, Gardiener (2006) describes climate change with the well-known term "the tragedy of the commons".

2. 3. Evaluation of the time-impartiality arguments

We tried to find supporting and criticizing arguments for the following statements: i) one does not have any special reason to prefer possible future people over currently living people ii) one does not have any special reason to prefer currently living people over future people.

We found two important arguments that support the claim that one does not have any special reason to prefer possible future people over currently living people. The high discount rate argument said that since the average well-being is increasing and there is a need for a probability discount, there is a need for discounting future people's goods (see Nordhaus 1994 and Stern 2007 in Broome 2008). Its implication seemed reasonable from a philosophical perspective as well, because it would be unjust to prescribe for the poor (currently living people) to transfer goods to the rich (people in the future). However, we could criticize this argument with the use of Schelling's idea: if one takes a closer look, he realizes, that in case of anti-climate change spending the transfer goes from currently rich people to the descendants of the currently poor people, who will be probably poorer than present-day rich people (Schelling 2000). Even from an economic

perspective, there are serious critiques of the high discount rate (see for example Stern's work), because we need to take into consideration the economic cost of the climate change. We will come back to this question in the following parts of the thesis. The uncertainty argument was the second strong supporting claim for not preferring future people over contemporaries, or even discriminate against them in our decisions. We do not know exactly the long-term effects of our policies, so it is hard to assign exact probabilities to right violations in the future (McCarthy 1997, Oberdiek 2012 and Perry 2014 in Mayer 2016). However, based on Hulme's (2011) argumentation we should not apply this way of thinking to the climate issue. He says that there should be no burden of proof on those who claim that the climate change is harmful, even if the level of global warming and climate change is uncertain. I agreed with this inverted burden of proof in this paper, and we can also find several empirical evidences for the fact of climate change. In conclusion, as we have rejected important supporting arguments, I would not support the argument that one does not have any special reason to prefer possible future people over currently living people. This means that we do owe certain goods and rights to future generations.

Secondly, we took a look into the second part of Parfit's claim: one does not have any special reason to prefer currently living people over future people. On one hand, there is a lack of reciprocity between people who live in a different time period, Today's people can harm future people, but future people cannot repay the harm or benefit they got from us. We talked about whether a harm is only in those cases unjust when it is not reciprocal. We concluded, that it makes sense to differentiate between harming people who can harm us and who cannot. Consider the difference between hitting a heavily built 30-year-old man or a two-year-old child, who cannot harm us. I think that harm is especially unjust when there is no possibility of reciprocity. Therefore, we should care about future people. On the other hand, we highlighted that our acts in context of climate change are irreversible. We mentioned the empirical fact, that an emitted CO2 molecule remains in the atmosphere for hundred or even more years.

As long as we do not invent the technology that sequestrates carbon dioxide (and we cannot assume that people will invent it in the near future), we should think that our damage is irreversible. However, with the development of technology, this argument might change. Based on the asymmetric power relation and irreversibility premises, we can support the argument that one does not have any special reason to prefer currently living people over future people. However, following the Rawlsian theory, one should try to build and maintain just institutions (also today) in that everyone has individual and political freedoms. Therefore, the conclusion is that in general, we needed to care about future people's well-being to the same extent as our contemporaries: however, because of the fact of irreversibility and asymmetric power-relations, we have a special responsibility to care about future generations. In the following chapters, I will take a closer look into the empirical evidence and see whether we can fulfill the responsibility to care about future people's well-being, i.e. introduce and support climate change mitigation policies, and help today's poor people as well.

Chapter 3 – The effect of climate change on the poor

Based on the first part of my thesis, I state, that people of today should act, so they consider future people's well-being. However, these obligations conflict with the obligation to care about the poor today (Schelling 2000). It would be worth to look more into the "separateness of generations" and see the differences in the obligations of the wealthy and the least advantaged in this problem. To investigate this, there is a need to look a little more into the economic and social field of climate change. In this chapter, I investigate the possibility and difficulties to grow and reduce greenhouse gas emission at the same time. After that, I bring some empirical evidence from the literature of the development economics to the argument that poor people will be more strongly affected by the negative effects of climate change, and they will be less capable to adapt. I think that without the respecting empirical findings, it is hard to build normative opinion.

3. 1. Growth and emission

The most common critique of greenhouse gas emission reduction is that those countries that switch to a greener economy, cannot grow. Why is it hard to grow without a high amount of greenhouse gas emission? This question seems only empirical, but it has its normative implications.

If there was no trade-off between climate change reduction and growth, maybe Schelling's dilemma would not be there anymore, because we could easily help the poor and reduce emission at the same time. Mattauch et al. (2020) highlight that those people say that it is incompatible to grow and reduce emissions, who argue for the necessity of climate change reduction even if it is not possible to grow and be environment friendly and those as well who argue the opposite, i.e. growth is more important than greenhouse gas reduction. However, Mattauch et al. (2020) think that the carbon-dioxide emission reduction does not lead to such a great economic depression as imagined by others. One reason he highlights is that building renewable energy sources is less and less expensive compared to fossil fuels (Mattauch et al. 2020). This means that the price difference will be smaller between renewable and non-renewable energy, so the change will be necessary but less

costly compared to the current situation (Mattauch et al. 2020). At the same time, some activities that cause a lot of emissions, like meat-eating or flying are hard to substitute, but their added value is not so high, so their reduction will not lead to an economic decrease (Mattauch et al. 2020). However, he and his colleagues highlight that the "normative price" of these goods is debatable. Maybe the economic growth is sustainable even with greenhouse gas reduction, but it is questionable what is the normative cost of giving up these goods and activities (Mattauch et al. 2020). People's life might get poorer if they live an environmentally friendly life. However, to evaluate for example the vegan lifestyle, one should include also animal right premises and empirical arguments about the real effect of choosing vegan alternatives of non-vegan foods (including the cultivation and the transportation of the plants). These questions are not discussed in this work.

Regarding the distribution of the price of greenhouse gas reduction, it is worth considering the empirical fact that there is a difference between developing and rich countries regarding the driving causes of carbon-dioxide emissions. According to Ahmad and Zhao (2018) in poor regions, industrialization causes large-scale urbanization, and this also leads to a high amount of carbon-dioxide emission besides the emission caused by the industry itself. In contrast to that, in the subset of the richer countries, countries with higher GDP have less emissions on average because they can afford more environment-friendly solutions. This relation is called the Environmental Kuznets Curve in economy (Grossman and Krueger 1991 in Yandle, Bhattarai and Vijayaraghavan 2004). Based on this theory, one should describe the relationship between growth and environmental damage with an inverted U-shape curve, meaning that until a certain point the environmental negative effect increases as the income rise but above a certain income level, the emission of some negative substances - that cause environment degradation - decreases as income and consumption rise (Yandle, Bhattarai, and Vijayaraghavan 2004). Yandle, Bhattarai and Vijayaraghavan (2004) highlight the policy implications of the inverted U-shape relation between environmental change and income growth, namely that some measures that improve the economy may help the environment protection, but this is usually only in developed countries. Ahmad and Zhao (2018) argues, that in poor countries with the growth of the GDP, the urbanization grows. It is highly relevant in terms of emission reduction. It may be necessary to look for methods to grow but reduce the level of urbanization – especially the development of slums in those people live under the threshold of a decent life or make cities more environmentally friendly.

Based empirical theories, one could unjustly argue that only rich countries "deserve" the possibility of development, because they get more and more environment-friendly with growth. However, on one hand, the damage strongly depends on political regulations and the composition of production (Mattauch et al. 2020). On the other hand, it is possible even in poor countries to develop low emission but high value-added industry sectors, so it might be possible to grow the income without increasing the emission (Mattauch et al. 2020). Moreover, it would be unfair not to give the poor the possibility of development.

3. 2. Consequences of climate change on the poor

In this part, I would like to show, that even if climate change reduction might be costly for everyone, if we do not act early, it will cause more injustice in the future that the mitigation policies would cause today. Moreover, the burdens of CO2 reduction can be distributed more easily in a just way than the costs of global warming. Tol (2018) estimates the distribution of climate change's negative impact. Tol (2018) says based on several climate change studies, that with the increase of the temperature, the average GDP will decrease with about 1.4%, but this effect is not homogenous. The loss will be much higher in poorer, lower-lying and hot countries (Tol 2018). The developing countries are the most vulnerable because of three reasons (Tol 2018 p.10.): 1) agriculture unquestionably depends on the weather, the water resources, and in poor countries, agriculture is usually a significant part of the income. While, in richer countries, industry and services take a bigger part of the GDP. Those sectors are not so climate dependent. 2) Poor countries are already in the hottest parts of the world, and if the temperature gets warmer, they need to invent new technologies to adapt. While, if the countries, that have lower average

temperature, get warmer, they can copy the techniques and mechanisms used in warm countries. For example, according to Porter, (et al. 2014 in Tol 2018) in Africa, crop yields will be halved because of climate change. If the agricultural technology was better, this change would not be so drastic (Mendelsohn and Dinar 1999 and Howden et al. 2007 in Tol 2018) 3) The third differentiating cause is that developing countries will be less capable to adapt. On one hand, they will have less resources to pay for technologies that are necessary for the adaption. On the other hand, in some cases, not only the financial resources will be missing, but bad political institutions can also hinder necessary investments. For example, Bangladesh will be probably less capable of building coastal protection (Alam 1990 in Tol 2018). Coastal protection requires country-wide projects, but the government's interest is to keep people poor, so they can easily buy votes during elections (Alam 1990 in Tol 2018). Therefore, it is not the leadership's interest to build protection, it is better for them, if people suffer from floods (Alam 1990 in Tol 2018).

Inequalities can get deeper based on the fact, that climate change might affect even fertility rates (Casey et al. 2019). Is there a difference regarding our moral right between carrying out policies that decrease the fertility of the rich and the fertility of the poor? We must assume, that nonexistence is not better than a bad life (there is a huge philosophical debate about this question, I will not open in this paper). Based on the research of Casey and his colleagues (2019), the circumstances caused by the global warming in poor countries might incentivize parents to increase their number of children, and invest less in children's education, because a lot but unskilled workforce will be needed to work on the fields. There are other important driving factors of high fertility that go together often with poverty, such as the lack of women's rights, high child mortality, the lack of accessibility of contraceptives (Roser 2017). Van Ginneken and Razzaque (2003 in Roser 2017) studied that the education of women is the most significant in declining fertility because educated women accept and use more the possibility of contraception. Moreover, Becker, Cinnirella, and Woessmann (2010 in Roser 2017) found evidence that lower fertility allows better

education too, so the positive effect of education on fertility and the positive effect of fertility on education is a circular mechanism that can strengthen itself.

If we think about distributive justice among generations, the number of people and the proportion of poor people are important factors to consider. Based on the observation of Casey (et al. 2019), agricultural and poor societies will increase in their number more than the less affected ones. This might imply, that we must definitely prioritize global warming reduction, however, we must consider the fact, that it might be less costly to help today the poor because their proportion is smaller compared to the whole population, than their proportion will be in the future. But if we spend for helping the poor (today) instead of climate change reduction, then it is possible, that the poor will have less and richer descendants in the future so the descendants will also have a lower fertility rate. Moreover, if we reduce the fertility rate of poor people (by transferring them goods), that has an exponential effect in the distant future (the further we are in the future, the bigger the effect is, assuming a constant number of children per person). At the same time, if we do not spend on climate change reduction, in the future, more people will get poor, as the negative effects of global warming increase the fertility rate. We must note that rich people usually have a lower fertility rate, although their ecological footprint is much higher, so if we effectively want to reduce emission, rich people must control the number of their descendants and their emission as well.

As described before, there is empirical evidence, that the negative effects of climate change will not be distributed equally: the high temperature will cause more serious effects in the developing world than in the rich countries. This is also relevant if we argue for climate change mitigation. One must recognize that with putting too much burden on poor countries e.g. we force them to introduce carbon taxes, we might put them in a state where they will be much more affected by the negative effects of climate change than the richer ones. It is very important to analyze together the distribution of the burden today with the distribution of the costs in the future. As stated before, the burdens can be shared more equally than the cost will be distributed.

Chapter 4 - Three mitigation scenarios, and their analysis

In the following part, I will apply the intergenerational distributive justice theories to three simplified scenarios, that could happen in the context of climate change mitigation. It is important to remember that the situations are in a hypothetical state described in the beginning, so generations are not overlapping, and climate change happens in the future, i.e. its effects occur only in the future.

As observed before, some argue the greenhouse gases should be distributed equally, and others say that there is a need to help the least advantageous (Caney 2018 in his work refers to Meyer 2000). This later means that we should allow certain poor societies to use more fossil fuels than others if that is necessary to their development. Those who follow the *polluters pay* principle are less helpful. That principle goes against recently developed societies, who emit more greenhouse gases than developed countries (Caney 2018). As the topic of the thesis rather focuses on the distribution of goods among generation, and among the rich and poor, there is a need to ignore the polluters pay principle because that analyzes groups of countries based on their emission and not their income level. However, we can note that UN members follow this principle secures the most the property rights because no third party is forced to pay for transactions of others (Gevorkyan et al. 2016). However, it is important to see that it does not ease the inequalities.

Focusing on the difference between the rich and poor, I define the scenarios in the following way: 1) The first scenario is the following: no serious mitigation policy happens, so everything goes like before, temperature rise, causing economic cost in the future. 2) In the second scenario, the cost of greenhouse gas reduction is distributed equally, climate change mitigation happens globally. 3) The third scenario is also introducing mitigation policies however, the burdens are unevenly distributed, the wealthy take more cost than the poor. To make the comparison easier, there is the baseline scenario (scenario 0) in that no climate change happens, so there is no need to implement climate change reduction policies.

Reaching back to the distributive justice theories, I will compare the scenarios through the Rawlsian and through a time-neutral analytical frame, that is based on Parfit's, Caney's and Schelling's (and other economists and philosophers) view. Those prefer the first scenario, in that no mitigation happens today, who argue for a high discount rate (like Nordhaus 2007) or prefer today living people more than people in the future because just based on the fact that they live closer to them in time (pure time preference). In this scenario, those people who live today do not suffer from any utility-loss (the damage only occurs in the future). Every economy can grow in short term, as before because they do not have to reduce their greenhouse gas emission. This scenario affects people living today in a beneficial way. It is possible, that until the time, the negative effect of climate change realizes, some poor countries can develop a lot. It should be noted again, that in a hypothetical scenario, the negative effects of climate change come only in the future. The issue of global warming does not jeopardize one's initiative to help poor people who live today. As Schelling (2000) highlighted, there is an important trade-off between helping the poor today or saving for the future. However, as we do not act against global warming, people in the future will suffer from negative consequences, especially the poor, and their situation will become even worse than today. Based on Casey (et al. 2019), the fertility rate of future poor people, affected by the negative effects of climate change will be high, hence their number will probably increase more than the available resources.

The second scenario describes the equal distribution of burdens of greenhouse gas emission mitigation. In this thesis, I will not go into the details of climate change mitigation policies. Naturally, even a simple carbon tax has different mechanisms in different fields of the economy or in different regions. It can be even beneficial for someone, e.g. for those, whose economy can produce and export electric cars. Even equal distribution of cost can mean several mechanisms: one must recognize that the obligation, that everyone must reduce their carbon-dioxide emission with a given proportion, is different from the mechanism that everyone should substitute a given percent of their energy consumption with renewable energy, or from a third possible regulation in that the energy consumption itself is restricted to a certain threshold, etc. For the sake of simplicity and for consistency, I will not go into the details of policymaking. The introduction of mitigation policies is regarded as a cost for everyone, meaning that everyone realizes a loss in their income. In this scenario we must suppose, that resulting from the opportunity cost of climate change reduction, the poor people who live today get less support from the rich (today), and moreover, they must also take their part in greenhouse gas emission.

In the third scenario, unlike in the second, the poor do not have to carry the burdens of global warming mitigation. We can assume, using a hypothetical case, that people have a certain amount of resources that they can distribute between climate change mitigation policies and helping poor people. Given the fact that rich people spend their resources on climate change mitigation, they do not have left money to help poor people (today). At the same time, the poor can develop, as before because they do not have to reduce their emissions. The rich reduce the emission more, or they support green policies in the developing world, so the same amount of greenhouse gas reduction occurs, as in the second scenario. Naturally, green investments in the developing world usually have a very positive effect, even an increase in the income of local people can occur, but this effect is also disregarded in this scenario for the sake of simplicity. (In the last chapter I will talk about these kinds of synergies.)

Both in the second and in the third scenario because of the successful mitigation, future people will not realize a loss in their resources, compared to the scenario where no climate change mitigation happened. However, because of the significant resource loss today, that people save for the future, the general growth is a little slower compared to a hypothetical case in that growth would not be limited by global warming mitigation policies at all because there would be no climate

change. As the cost of mitigation concerns only the rich part of the world, we can assume that inequalities decrease both today (because the rich become poorer) and in the future in the third scenario.

Table 1 makes it easier to compare the utility losses in the different scenarios. Naturally, it is impossible to calculate the loss climate change causes, and the growth that happens if there is no climate change, but this rough estimate can be useful to have a picture of the distribution of goods. As Casey (et al. 2019) indicated, the poor will suffer much more than the rich, therefore I calculate with a 10% loss for the rich and 50% loss for the poor. As we must also assume, that poor people in the future outnumber their predecessors, their scarcity will be much higher compared to the rich. Regarding growth, I calculate with 100%, considering that the population is growing, and there will be some external shocks that can slow the economy (besides climate change). It is also hard to estimate how altruistic people are, or people would be if there was not the urgent issue of global warming reduction. I assume, as indicated before, that people have a given amount of money (here 10 to 11 percent) that they can give either for greenhouse gas emission mitigation or for the poor people. Realizing a loss because of climate policies is not differentiated from an act of giving in this calculation. At the same time, I also assume that in reality, people are not very altruistic, they would not give as much to humanitarian causes, as they are coerced to spend for mitigation policies (e.g. by carbon tax). Therefore, I calculated an alternative for this assumption, the results are in parenthesis in case of no mitigation policy (in scenarios 0, 1, and 3 where helping the poor today is an option). So, in these hypothetical cases, I partially agree with Schelling (2000) about the opportunity cost of climate change reduction. There is an opportunity cost, but if people do not lose part of their income because of restricting measures, they do not always donate all of their spare money voluntarily for humanitarian causes. Especially if we consider the status quo, i.e. wealthy people who live today consume more than they need, and they donate less than they could. So, the respecting cases are calculated in a second way, with only 5 units of donation, that is also quite high - one can see the result in parentheses in scenarios 0, 1, and 3. To make the cases involving the issue of climate change more illustrative, the first column shows a case, where no climate change happens at all, so there is no need for mitigation policies, and people in the future will not suffer from utility loss. Note again, that naturally, these calculations are not suitable to estimate economic or social outcomes, but it is useful to compare the scenarios and have a picture of the different policies in terms of distribution.

In the starting point, in every scenario the poor have 10, the rich have 100 unit of utility. In the cases where no mitigation policy happens, the rich give 10 (or in the less altruistic scenario 5) units to the poor, so inequality decreases more than in the cases where people reduce their emission. The money people give away for climate change reduction (in cases 2 and 3) is not "returning", only in the future generation. Growth is realized only in cases, where no climate change happens (or at least climate change policies are implemented). Naturally, it is hard to estimate, to what extent people of today could reverse the negative effects of climate change. Probably, the mitigation policies need more investments in the future as well, so this extent of growth is probably an optimistic scenario. Although, one can reach mathematically the 100% growth in less than 40 years with only 2% growth a year.

	no climat	e change	climate change					
	no mitigation policy (scenario 0)		no mitigation policy (scenario 1)		mitigation policy, burden equally shared (scenario 2)		mitigation policy, burden shared by the rich (scenario 3)	
	poor	rich	poor	rich	poor	rich	poor	rich
now	10 u	100 u	10 u	100 u	10 u	100 u	10 u	100 u
transfer for poor (now)	+ 10 u (+ 5 u)	- 10 u (-5 u)	+ 10 u (+5 u)	- 10 u (-5 u)	0 u	0 u	0 u	0 u
spending for global warming mitigation	0 u	0 u	0 u	0 u	- 1 u	- 10 u	0 u	- 11 u (- 15 u)
after spending	20 u (15 u)	90 u (95 u)	20 u (15 u)	90 u (95 u)	9 u	90 u	10 u	89 u (85)
growth (100 %)	+ 20 u (+15 u)	+ 90 u (+ 95 u)	0 u	0 u	+ 9 u	+ 90 u	+ 10 u	+ 89 u (+ 85 u)
damage (10% to rich, 50% to poor)	0 u	0 u	- 10 u (-7.5 u)	- 9 u (- 9.5 u)	0 u	0 u	0 u	0 u
future	40 u (30 u)	180 u (190 u)	10 u (7.5 u)	81 u (85.5 u)	18 u	180 u	20 u	178 u (170 u)
inequality	180 u / 40 u = 4.5 (190 u / 30 u = 6.3)		81 u / 10 u = 8.1		180 u / 18 u = 10		176 u / 20 u = 8.9 (170 u / 20 u = 8.5)	
sum	220 u (220 u)		91 u (93 u)		198 u		198 u (190 u)	

Table 1 - Change in the utility of people in four different scenarios Note: a less altruistic scenario in parentheses

If we look at the outcomes, we can see with the Rawlsian maximin method, that the no mitigation policy case is probably the worst for the least advantaged people. Every other case must be better for them. Among the cases that involve mitigation, naturally the one in which the rich carry the burden is better for the poor both in the short and long term compared to the case in that the least advantaged also need to save for future. Especially if we consider the fertility argument, that development now can decrease the fertility rate, so in the future the descendants of poor people would be less numerous than they would be if the richer part of the world would not support them today. Naturally, migration might change the composition of some regions, probably there will be migration waves from damaged areas. However, in this thesis I do not focus on the fact in which nation people live, rather I compare the situation of the poor and rich in a cumulative and abstract way. But I recognize that the inequality within nations affects strongly the life quality or at least the

perceived life quality of people. Climate change must even cause conflicts, especially in regions that are strongly affected by the damage caused by global warming, so that escalates the suffering of poor people. Hsiang, Burke, and Miguel (2013) created a metanalysis of studies that analyzed the effect of climate change on conflicts. According to their study, one main driving factor of conflicts connected to climate change is declining economic production. The bad economic situation may affect people directly: the cost of participating in a conflict reduces compared to economic activities, or through the state: the governmental institutions become weaker because of the shortage in tax revenues, so the authorities become less capable to maintain the order within the state (see for example Miguel et al. 2004 in Hsiang, Burke and Miguel 2013, and Zhang et al 2011 in Hsiang, Burke and Miguel 2013). Besides the mechanism of the bad economic situation, the increase of inequalities or a significant change in food prices can also lead to conflicts (see e.g. Hidalgo et al. 2010 in Hsiang, Burke and Miguel 2013, and Lagi et al. 2011 in Hsiang, Burke and Miguel 2013). Following the meta-analysis, climate change will increase migration, both inter-state and intra-state, and increase urbanization, this may be a further driving factor in the evolution of conflicts because geographically stationary resources will become scarce for the rapidly increased population (Jensen, Gleditsch, Rain 2009 in Hsiang, Burke and Miguel 2013). Naturally, mass migration and conflicts affect the richer part of the world as well, by rising military costs or endangering trade. Based on development economy studies, one can see that climate change can cause conflict in different ways, making life in the affected areas less bearable.

In the Rawlsian framework, the enjoyment of basic rights has a higher priority than the way of the distribution of goods (see Rawls 1971). Naturally, these factors are in strong connection, as if people suffer from extreme poverty, they cannot enjoy many basic liberties. But it is important to highlight that not only the financial situation, but the political regime of the country people live in matters from a human rights perspective and from a distributive justice perspective. The presence of conflicts or mass migration can also strongly influence people's scope of rights. With a Rawlsian framework, we should decide for mitigation policies based on these human rights considerations.

as well. Naturally, if the rich take the cost of mitigation, that makes less probable the appearance of these problems in the developing world. One should note that Rawls (1971) suggests the veil of ignorance method to decide about the just way of distribution. We can apply that method to different generations and also to different social classes, i.e. in the original position one does not know which generation and into which social class he or she will belong (Rawls 1971). This implies that one would like to choose the best worst possibility. With this method, it is hard to evaluate the not exact calculations of the scenarios. Nonetheless, we can say, that one would not choose the scenario in that the burden of mitigation is carried by the poor and as by the rich together (scenario 2). But the no mitigation scenario (with the less altruistic calculation) is even worse for the poor. We can see that if we apply Rawls's veil of ignorance method not only to different generations but on the combination of different generations and different social groups, we would choose scenario 3, in that there is mitigation policy and its burden is carried by the rich. This can be supported by the arguments about the basic rights we had before.

A total utilitarian (who want to maximize the aggregated utility) could argue for the second scenario, as the sum of utility, in this case, is higher than in scenario 3, where the burdens are carried by the poor as well. In the last column, there is a second calculation in parentheses, that shows, that if the rich take the whole cost of climate change mitigation that must be more costly than the sum of the utility spent for mitigation in the second scenario. Therefore, it is certain, that the sum of utility will be less in the third case, than in the second. Those who are not prioritarian i.e. do not think that a given amount of utility has more value if that goes to a poorer one, they could argue for this distribution of goods. However, even Singer could argue for the third scenario (in that the cost is carried by the poor), based on the effectiveness argument. He argues for effective altruism (Singer 1972) meaning that it is not enough to be generous, one must donate to causes that are effective in helping people. Taking into account that in the second scenario, where the poor are also obliged to reduce its emission, they can much less develop, even their fertility rate will be higher, so they

would be more numerous, I think Singer would agree to let the developing world to relieve from the duty of global warming reduction.

We can see, that even if different theories have different approaches, they point in the same direction, namely that the richer part of the world should wear the burdens of climate change mitigation. At the same time, it would be very unfair to state that our obligations to help the poor today rule out the task of climate change mitigation. Schelling (2000) said that it might be unjust to choose to invest in greenhouse gas reduction in favor of the descendants of (today living) poor people, instead of helping poor people today, and decide in the name of people living in developing world. I think this argumentation is worthy to consider, but in case of any donation we decide in the name of poor people: for whom and for what cause we would spend our money, e.g. some prefer to help children in a warzone, and others spend their money on malaria disease prevention. Both are probably deciding in the name of the people in need. It would be unreasonable to say that one should never spend their money to help "A" because there might be also "B" in more serious need. Following Singer's (1972) argument only the effectiveness of our donation should matter, i.e. how successful it increases people's well-being. In case of climate change mitigation, there is a place for concern regarding the effectiveness of our mitigation policies, however, we can be sure that probably the descendants of today living poor people will suffer from the negative consequences of global warming, and it will even increase the problems of the developing world.

Chapter 5 – The possibilities to harmonize our different obligations

It is not the aim of this thesis to go into technical details of development and environment policies. However, we should see that we can help people with investing in climate change reduction. We can hope that one can harmonize their obligations in practice as well because there are some policies that can both help the developing world and save the environment. In international policymaking, the most powerful framework that approaches the help of today's generation with the initiative of not damaging the environment of future people is the idea of sustainable development. The most well-known policy conceptualization of this idea can be found in the list of Sustainable Development Goals. In a respecting document of the United Nations General Assembly (2013): Intergenerational solidarity and the needs of future generations it is argued for temporal impartiality regarding the subjects of our moral concern. Based on this, it is highlighted that sustainable development means that one should not prioritize the problems of current people at the cost of future people's well-being. The authors of this report have a similar approach to the third scenario I defined earlier. It states that the least advantaged should not carry the burden of future people's well-being. Sachs et al. (2018) conceptualized the implementation of the Sustainable Development Goals, and they highlighted that the transitions should be implemented with the consideration of the leave-no-one-behind principle. This means that progress should be made everywhere, but it is very important to reduce inequalities and help the least advantaged. In the following part, I will briefly examine what are the areas where the interests of the future and current generation are especially conflicting, and what are the policy areas where it is easier to harmonize the goals.

Until this point, we talked about global warming mitigation and the improvement of the least advantaged people's well-being as a clear trade-off. However, there are some policy areas in which one can satisfy both aims. For example, with education, on one hand one can reduce poverty, and encourage growth (Sachs et al. 2019). On the other hand, a society with strong human capital may be more capable to invent and apply environment-friendly technologies (Sachs et al. 2019). Moreover, with the education of girls, one can also improve gender equality and reproductive health that leads to a lower fertility rate (Lutz, Cuaresma, and Sanderson 2008 in Sachs et al. 2019, Glasier et al. in Sachs et al. 2019). Another good example can be renewable energy use. Kümmerer et al. (2018 in Sachs et al. 2019) highlight that with the transformation to modern energy sources that is a key element in carbon-dioxide reduction - we can also reduce the pollution of nature. Pollution reduction can contribute to a significant increase in life quality of people around the globe (Kümmerer et al. 2018 in Sachs et al. 2019). We highlighted before that urbanization is an unavoidable consequence of economic growth (Ahmad and Zhao 2018). Air pollution is a significant problem of big metropolises – not only in poor counties. With air pollution reduction many diseases could be prevented (Kümmerer et al. 2018 in Sachs et al. 2019). The soil and water pollution reduction can also contribute to a healthier life. Hence, the increase of clean, decarbonized energy use can contribute to people's well-being in many ways. At the same time, with the reduction of accessibility of fossil fuels, or with the introduction of strict green rules, it is possible that the poor will face difficulties, even lose their access to energy. Therefore, policymakers should introduce these policies carefully with providing the necessary help for the poor.

We could see that there are some policy directions with them one can harmonize the aim to help today living people and people living in the future, i.e. protect the environment. However, one should not be overly optimistic, Sachs et al. (2018) highlighted that there are some explicit trade-offs between improving people's life quality, fighting poverty and global warming mitigation. One respecting area is agriculture which is anyway strongly exposed to climate change (as discussed earlier). To decrease malnutrition and hunger, there is a need to increase agricultural production (Sachs et al. 2018). Moreover, the more the income of people increases, the more food will be processed, consumed, and probably even transported. Unless people switch to an environmentally friendly diet, the increased food production will be unsustainable, resulting in not only nature damages, but even the food production itself will be endangered – e.g. by overfishing or bad water management (Sachs et al. 2018). Yet, nutrition and diet can be also regarded as a field in which people can mitigate global warming and improve their life quality at the same time. Springmann et al. (2016) found that with a global switch to a healthy diet, we could improve health and reduce carbon-dioxide emissions simultaneously. The high amount of red meat consumption (that is especially common in Western high-income and middle-income societies) and low amount of fruits and vegetable consumption (that is especially common in Sub-Saharan Africa), lead to many health problems (Lim et al. 2012 in Springmann et al. 2016) besides contributing to high emissions. They found that if people could switch to a healthy diet (they conceptualize exactly in their paper), CO2 emission could be reduced by 27-70% by 2050 compared to a business as usual scenario (Springmann et al. 2016: 4). One can see that there is a need to make careful decisions both about production and food consumption to achieve a positive change, but we can find several synergies with climate change mitigation.

Another controversial area in the connection between development and climate change is digitalization. Sachs et al. (2018) highlight the importance of digital technologies as a relevant tool to reduce emissions. A digital transition can also raise productivity, so the sum of distributable goods will be higher, technologies can also help the poor, at the same time there is a risk that inequalities will increase due to digitalization, for example, lot of low-skilled workers will lose their jobs because of robotization (Manyika et al. 2017 in Sachs et al. 2018). It is important to help the digital transition of the less developed countries to secure that after the transition it will be better for the least advantaged.

In practice, there are some new financial tools that foster investment into projects that are helpful in climate change mitigation. Gevorkyan et al. (2016) write about the possibility of sharing the cost of global warming mitigation among different generations or even postpone the spending on green policies. Green bond investments make possible the investors loan money for "future people", and for current poor people at the same time, i.e. for environment-friendly projects even in the developing world. This makes possible the burden-sharing between generations (Sachs 2014 in Gevorkyan et al 2016). The loans can be spent on climate change mitigation, and they will be repaid by future people – who are the beneficiary of the spending. Naturally, this idea can be more understood if we do not keep our official hypothetical framework in that the negative effects of climate change occur only in the future: there are many projects that help to mitigate the already visible negative effects of global warming. Usually, but not always, these projects also help to reduce inequality and make progress in the developing world (Gevorkyan et al 2016). Besides projects that help current adaptation efforts, others affect people only in the future – these are relevant in our framework. However, one can see that even future-oriented projects usually require the labor force today, so these projects could also be considered as initiatives, that reduce inequality today, and in the future, as well. At the same time, the most relevant feature of a green bond is that it makes it possible to postpone the date of payment for climate change mitigation projects (Gevorkyan et al. 2016). It is also important that the cost can be taken by those, who volunteer to invest - this leads to the mechanism in that the wealthy lend money to the poor. Moreover, green bonds are not only morally but also economically worthy to buy, which is crucial in climate change mitigation and poverty reduction, as people are not enough altruistic to transfer their extra savings to good causes (Gevorkyan et al. 2016). Nevertheless, to buy green bonds, one must usually sacrifice a higher rate of return of their money, in order to help good causes. Naturally, the existence of these investment possibilities does not solve the distributive justice questions between generations, but they may open new perspectives in the long term.

Based on the inquiry of this chapter, there is a place for optimism. It is possible to harmonize the goals of climate change mitigation (i.e. transferring goods for people in the future) and reduce poverty today. People of today should be willing to change their way of life (e.g. change for an environmentally friendly diet) and invest in clever sustainable development policies, which do really improve the well-being of the least advantaged and also help the environment.

Conclusion

In my thesis, I attempted to answer the urgent question of what rights and responsibilities do we owe to future generations in the context of climate change. I used normative and empirical findings to investigate the problem. Let me briefly present the main arguments I found.

In the first chapter of my thesis, I looked into the normative question of intergenerational justice, in a general way. With the help of the theories of Rawls, Singer, and Parfit, I defined two different distributive justice strategies, that apply to intergenerational relations as well. Parfit says that we must avoid harm in general, but this obligation applies equally to present and future people. He proposed time-impartiality, and he follows a utilitarian method. John Rawls writing about the Just Savings Principle states that we have to establish a system in that we save for future people, and if that system is just, we do not have special individual obligations towards future people anymore (we just have to maintain those just institutions). The just saving rate can be declared applying the original position, so from behind 'the veil of ignorance'. In the veil of ignorance, one follows the maximin method, i.e. one attempts to maximize the well-being of the least advantaged because one does not know into which generation one will belong to. I also used Singer's ideas to highlight the similarities between time-impartiality and cosmopolitanism. Applying Singer's cosmopolitanism, to the relations of people who live in a different period of time, we can say that difference in itself should not have an effect on our moral obligations towards poor people. Schelling got to the same conclusion, also according to him, we can apply the cosmopolitan method to different time periods as well. It is also important to highlight that Singer argued that the fact that others help too, should not matter - regarding the climate change this claim opens several further questions of responsibility, that were outside the scope of the thesis, but it is important to see that our obligation continues even if others have the possibility to help too. At the end of the first part of my thesis, I focused my scope of inquiry on one statement, that I investigated in the second chapter of my thesis. It is the following: we do not have special reason to prefer possible future people over currently living people, and vica versa.

In the second chapter, I disagreed with the arguments that supported the claim that one does not have any special reason to prefer future people over currently living people, and I agreed with the arguments that one does not have any special reason to prefer currently living people over future people. To get to this conclusion, I looked into the debate of discounting both in the economic and philosophical literature. The most important counterargument against the calculation with a high discount rate was Schelling's thought, that in the case of climate change mitigation, the transfer goes for poor people in the future, who will be poorer, than the contemporary rich people. I call this differentiation the separateness of generation. Moreover, I enumerated the most important differences between our relations to present people and our relations to future people; future people cannot influence us: they cannot harm or help us, cannot restrict the scope of our possibilities. This prohibits the possibility of being right holder for future people against today's people according to the Will Theory of Rights but does not prohibit the possibility based on the Interest Theory of Rights. I agreed in my thesis with the later idea. I have also rejected the importance of the knowledge problem, i.e. we do not know exactly the effects of our policies, and the further we are in the future, the higher the uncertainty is. This cannot decide our obligation towards future people in the context of climate change because we do have scientific evidence about the negative effects that will occur in the future. On the other hand, I have mentioned two very important arguments that support the claim that we have reason to care about future people's rights: the effects are non-reciprocal and the damages are irreversible. I disagreed with the argument raised by Lawford-Smith that compensating and not causing harm are different. Moreover, I said that in the case of climate change we do not know exactly the scope of harm we cause, so we cannot compensate completely, hence it is better to stop causing harm. Especially because it is possible that the harm, we cause to the living condition (nature, the climate) is irreversible. So even if we could somehow compensate future generations by saving them other goods, that are not in connection with the changing environment, they would be in a worse situation than us - they would have a less habitable environment. That enforces the future generations to care more about

the livable conditions if those conditions will be achievable at all. They will have to reduce their scope of preferences and focus more on the maintenance of the livable conditions much more than our generation. Reducing the scope of actions for further generations is unjust. By the analyses of these considerations, I concluded that even if the opportunity cost seems high, we should care about future people's suffering. However, it remains a very hard decision whether to help today's or future's deprived people. Schelling highlighted this difficulty that if we choose to invest in greenhouse gas reduction in favor of the descendants of today's poor people, instead of helping poor people today, we decide in the name of people living in the developing world. This is a puzzle I tried to analyze in the next parts of my thesis.

In Chapter 3, I looked into the relationship between growth and emission reduction. If carbondioxide emission reduction led to great economic depressions, it would be much harder to justify the obligation to mitigate global warming. Nonetheless, I found optimistic estimations, according to which it is possible to grow and switch to a green economy at the same time. Naturally, it has its costs, otherwise, the trade-off between helping the poor and mitigates global warming would not exist at all, and the main questions of the thesis would be irrelevant. At the same time, I investigated the different mechanisms that shape the relation between emission and growth. I highlighted based on studies of economists that there is a significant difference among poor and rich countries. In poor regions urbanization is the main driving factor of emission increase, on the other hand, in rich countries, the industry. Moreover, the relation between emission and growth is non-linear, until a point with growth, the emission increases, but after that, it decreases (the highly developed countries can apply more environmentally friendly technologies). This is relevant in terms of the declaration of responsibilities. I argued, that this U-shape relation and the significant differences between countries at different stages of development should not mean that only rich countries "deserve" development. On the opposite, developed countries have the responsibility to help the less advantaged, and mitigate the negative environmental externalities of growth (e.g. help to achieve greener urbanization or cleaner industry). In the second part of the third chapter, I found more evidences in the development economy literature that argues that the consequences of climate change will be especially negative in poor regions, and poor people will be less capable to adapt to the new conditions. Considering this, it is clearer, that mitigation policies should not make the situation of the least advantaged even worse, so it should not stop the development of poor countries. The main arguments I explained were the following: agriculture is significant in poor countries which is vulnerable to the effects of climate change; poor people already live in the hottest part of the world; and poor countries will be less capable to adapt, moreover, the fertility rate is likely to be high, that deepen poverty. Based on these, I found that the burdens of mitigation can be shared more equally than the cost will be distributed in the future. This makes our responsibility more urgent.

In the next part of my thesis (Chapter 4), I attempted to define three scenarios and decide which is the best, in order to synthesize the earlier collected empirical evidence and normative premises. There is a business as usual scenario (scenario 1), and two, in that there is mitigation, in one the costs are carried both by the rich and the poor (scenario 2), and in the other (scenario 3) only the rich takes the burden of mitigation. To create a baseline, in scenario 0, I described a situation, in that no climate change happens. To understand the situations more, I had also incorporated besides the mitigation spending and the damage of climate change a transfer that goes from the rich to the poor (to visualize the trade-off between helping the poor today or people in the future), and a growth that can happen in a given timeframe. Naturally, my calculation was not exact (it would be impossible to estimate these transactions exactly), I argued that we could compare the essence of the scenarios. I reviewed further evidence, about the possibility of climate change decreasing the well-being by increasing inequalities, causing conflicts, or mass migration. This is relevant if we evaluate the situation in a Rawlsian framework, in that the basic rights play a more important role than the distribution of goods. Almost every principle, I considered lead into the same direction and implied that the third scenario is the fairest. Therefore, I concluded, that there is a need for mitigation policies and the burdens should be carried by the rich.

In the last chapter (fifth), I investigated the possibilities, that allow harm reduction and help the poor at the same time. I found areas as education, technology, nutrition, pollution reduction, and digitalization in that there is a possibility to harmonize the two obligations at the same time. I highlighted that this idea is defined as the idea of sustainability, and it played a key role in policymaking in the last decades. However, even these sustainable development directions have the danger of leaving the least advantaged behind, e.g. with digitalization, many can lose their jobs. On the other hand, there are some poverty reduction means (the increase in food production) that may be in contrast with global warming mitigation. Hence, one should be very careful in policy implementation. I did also note the possibility of postponing the payment for mitigation policies. This is a question that needs more ethical investigation, yet, it is promising in solving the problem of who carries the costs of mitigation policies.

To conclude, I found that we have obligation to care about future generations in general. Therefore, our generation has a responsibility to mitigate global warming. Especially because the least advantaged will suffer from the negative consequences the most. At the same time, this aim should be reached by not forgetting our contemporaries in need. For some extent I could ease this puzzle with the help of empirical evidence. We can be optimistic about the possibility of caring about future people's well-being and helping today living poor people at the same time. To achieve this, there is a need for urgent and structural change in our way of life.

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