Justice and Economic Growth in a Circular Economy

A thesis on the implications of intergenerational egalitarian justice on strategies of economic growth in a circular economy

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Date: 12 June 2017

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Introduction

We talk of combating anthropogenic climate change. The goal of this, in the end, is always defined in human terms. Although many people take an ecological view, viewing the earth as valuable in itself, most people define climate change through its effect on people. That is what I will do in this thesis. Jurassic Park author Michael Crichton MD, wrote one of the most poignant texts on this topic in a prologue to Jurassic Park:

> "You think man can destroy the planet? What intoxicating vanity.
> Let me tell you about our planet. Earth is four-and-a-half-billion-years-old. There's been life on it for nearly that long, 3.8 billion years. (…) Earth has survived everything in its time. It will certainly survive us. (…) Of course, it would be very different from what it is now, but the earth would survive our folly, only we would not. (…) A million years is nothing. This planet lives and breathes on a much vaster scale. We can't imagine its slow and powerful rhythms, and we haven't got the humility to try. We've been residents here for the blink of an eye. If we're gone tomorrow, the earth will not miss us" (1990, p. II).

What we should be worrying about, and what I will worry about in this thesis, is how we can bring our own activities and the earth's 'slow and powerful rhythms' in a balance that works for *us*. Kate Raworth (2017) has described what we need to achieve such a balance, or as she calls it "the safe and just space for humanity". This so-called 'doughnut' is shown below in Figure 1. She defines two things: a social foundation as a threshold for the thriving of human beings, and an ecological ceiling that we cannot cross if we want to keep thriving. In other words, under the ecological ceiling lies the possibility for a safe environment where we can create a socially just space for ourselves.

Figure 1. The safe and just space for humanity

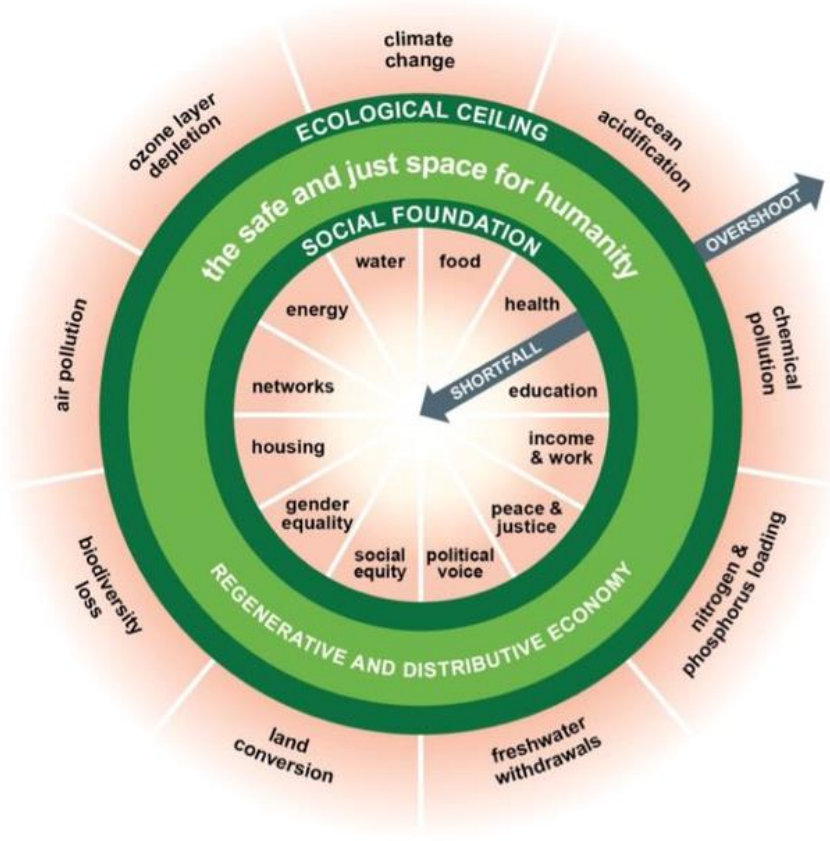

Figure 1. A visual representation of doughnut economics. Adapted [reprinted] from Doughnut Economics (p. 38), by K. Raworth, 2017, Vermont: Chelsea Green Publishing Co. Copyright 2017 by K. Raworth.

The ecological ceiling

Let's start by looking at the ecological environment that we live in. Since the mid-twentieth a process often called the 'Great Acceleration' has been happening. As the global population almost trebled in size human activity on the planet intensified dramatically, which has resulted in a surge of income and welfare but also a surge of green-house gasses in the atmosphere, biodiversity loss and ocean acidification (Raworth, 2017, p. 40). Our increased activity has certainly put our life-sustaining systems under pressure. Earth's temperature has fluctuated over the ages, but it became relatively high and stable in the last 12,000 years, otherwise known as the Holocene. This period of perfect balance has provided us with everything we need to thrive in great numbers. If undisturbed, this perfect equilibrium could last for another

50,000 years. Unless, of course, we upset its patterns. Because of our actions, we have altered the environment so significantly that scientists have started speaking of the Anthropocene: "the first geological epoch that is shaped by human activity" (Raworth, 2017, p. 41). To chart this planetary change that we are causing, Steffen et al. (2015), as a development on the renowned 2009 article, have identified nine critical life-sustaining systems that regulate our perfect Holocene-environment. The question they asked is: how far is too far? When will we alter these systems in such a way that it puts our survival in jeopardy, causing unknown and unexpected changes? As becomes apparent in their visualisation of these boundaries in Figure 2, is that we have disturbed the balance of three of these life-sustaining systems.

Figure 2. Planetary boundaries

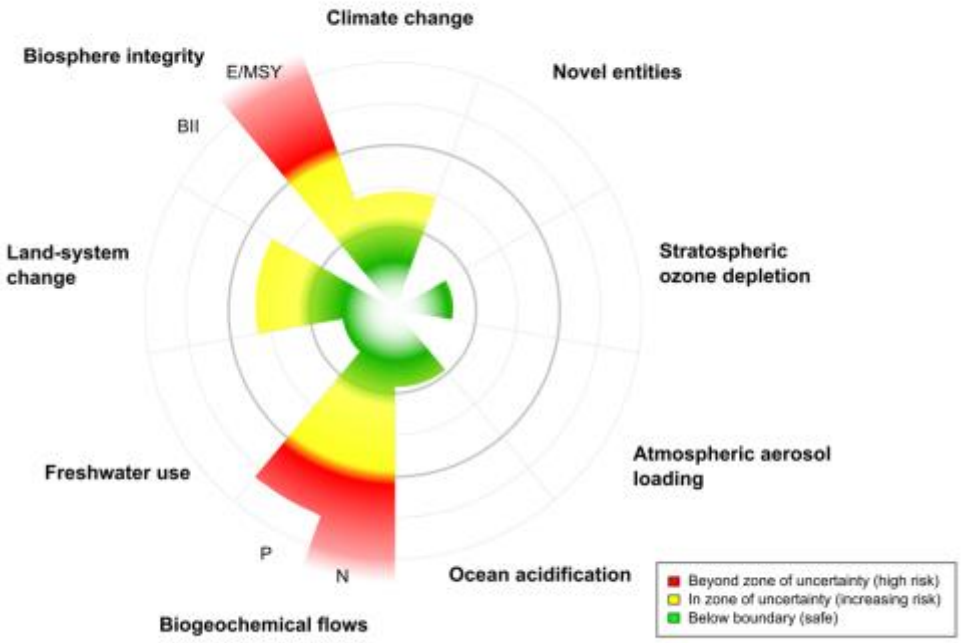

Figure 2. A visualisation of the critical environmental boundaries of our planet with a risk assessment per boundary. Adapted [reprinted] from "Planetary Boundaries: Guiding Human Development on a Changing Planet," by Steffen et al., 2015, *Science, Vol. 347*. Copyright 2015 by "Science".

Social foundation

Not only have we exceeded the ecological boundaries, many states are also struggling in providing the social foundation. The social foundation exists of twelve components:

> "These twelve basics include sufficient food; clean water and decent sanitation; access to energy and clean cooking facilities; access to education and healthcare; decent housing; a minimum income and decent work; and access to networks of information and to networks of social support. Furthermore, it calls for achieving these with gender equality, social equity, political voice, and peace and justice (Raworth, 2017, p. 39)".

These goals are comparable to the 2015 United Nation's Sustainable Development Goals. These goals are worth our attention any day, but especially these days of worrying about climate change. Raworth's message is clear: "human thriving depends on planetary thriving" (2017, p. 43). An overshoot of the ecological ceiling has effects on our ability to provide the social foundation. This upsetting of the natural balance therefore causes many questions of a philosophical and ethical nature. Gardiner et al. (2010) discuss many issues, such as questions of responsibility for current climate change effects, the difficulty of assigning costs for adaptation and mitigation to climate change internationally, and doubts about the ethics of intentionally manipulating the climate system. There are many questions of justice that deal with the relationship between contemporaries. For instance, what should our involvement as a developed nation be in the disasters that occur in island states where land disappears into the sea, or towards states suffering from desertification? I will not discuss many of the questions they raise. Questions of international climate justice are not a topic for discussion here, although I will mention its relevance in relation to my topic at some points in my argument.

This thesis will, instead, focus on exploring the philosophical arguments connected to the issues that Raworth raises. Ethics comes into play when climate change starts having an effect on people and on justice. As we face a possible future where the social foundation becomes threatened even in our most developed nations, we need theories of justice that encompass principles of intergenerational justice.

Intergenerational justice, put simply, deals with questions of justice *between* generations. This becomes very important when dealing with climate change, as the actions of our predecessors have caused the, often devastating, climate change effects we are experiencing now, and our own actions will have profound impact on human society in the future. In particular, it will have a great impact on social welfare in the present and the future. I will define social welfare as the sum of the twelve elements Raworth has provided in her social foundation. Any action that we can take that promotes these elements, I define as an increase of social welfare. It is, essentially, a measure of the quality of human life in a society. Social welfare differs from individual welfare in that it deals with the welfare of the collective. In the following chapters I will be addressing ways of assessing national social welfare as an instrument of economic policy. Quantifying social welfare is difficult to begin with, let alone to extrapolate it to scenarios for future generations. I discuss this issue of intergenerational justice in the first chapter of this thesis. In connecting social welfare to justice, there is another question we need to address here: what is the difference between justice and social welfare? Justice, in whatever theory of justice you employ, states what social welfare means and how it should come about. It provides us with a guiding set of principles to assess what is right and what is wrong. Therefore, justice is not necessarily about creating social welfare. Instead, it is about defining principles to bring about what is morally *right*. Some would feel improving social welfare is morally right, others will give priority to other principles. In the case of this thesis I will employ an egalitarian view of justice, which does take characteristics of social welfare, as discussed above, as a matter of justice. My focus will be on justice between the governing state and its (future) citizens. Different theories of justice have different ideas about the distribution of social welfare and even what social welfare entails. In defining social welfare in the way that I did, I have already implied what my theory of justice requires.

The question of justice for future generations has been central in the debate about climate change adaptation and mitigation since the Brundtland report was published where the following definition of sustainable development was given:

> "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, ch. 2, para. 1)

The concept of sustainable development is constructed to encourage certain globally coordinated directions and types of economic and social development. The main question that follows from this definition of sustainable development is if it is equitable to sacrifice options for future well-being in favour of supporting our current lifestyles. The implicit answer is that it is not, but it remains unclear what *would* be an equitable way of providing for future generations while still providing for the current one. Consequently, Daly (1996) points out that this definition of sustainable development is sufficiently vague to elicit many and varied interpretations. But it does, at least, make us realise what the central relationship in this issue of climate change is: the relationship between us and the generations that will follow us. The definition of sustainable development contains two main concepts: (i) concept of needs of human beings, and (ii) the concept of limitations imposed by the state to meet present and future needs (Brundtland, 1987, ch. 2, para. 1). A view on the needs of human beings is given by Raworth through her social foundation. The limitations a state can or should provide is subject of discussion in this thesis.

We need rules to make sure of, basically, two things: (i) that future generations in developed nations can continue to live above this social threshold, and (ii) that developing nations can reach or maintain this social foundation without overshooting the ecological ceiling. This first set of rules will be the subject of this thesis, as I will focus on these developed nations, characterised by the postmodern, neoliberal and capitalist nature of their political and economic systems. In particular, I will be discussing the implications principles of intergenerational justice will have on our economy. Economics is a central topic in dealing with climate change, because it has a great influence on the activities of man. Intergenerational justice deals with the question of what we should provide for future generations. That question is in large part economic in nature, as the social foundation Raworth describes is dependent on economic activity generating wealth and capabilities. That is why economic theory will play a central role in making sure we arrive at this 'safe and just space for humanity'. Raworth writes: "Economics is the mother tongue of public policy, the language of public life and the mindset that shapes society" (2017, p. 5). If we can change that mindset off its collision course with the earth's systems, we might stand a chance to safeguard our future yet. The second chapter of this thesis will deal with our economic mindset and its most central and destructive paradigm: the goal of GDP growth. As the

first chapter gives us a set of rules to chart our course for the future, the second chapter focuses on economic growth as the central element in our current view of our economic future. I have mentioned above that the 'Great Acceleration' has in many ways been the cause of the imbalance of our life-sustaining systems. This 'Great Acceleration' is inextricably linked to our view of economic growth as the greatest economic good. I will discuss strategies of economic growth and their relation to our ability to arrive at that safe and just space for humanity and I will argue that the current paradigm of maximisation of economic growth is incompatible with intergenerational justice. If we take our social foundation and our ecological ceiling seriously, a goal of maximising growth does not make sense anymore and I will show that it has, in fact, become indefensible.

So, what should this new economic paradigm look like? One paradigm that has steadily been gaining traction over the past few decades is circular economics (Tukker, 2016). Circular economics is a blueprint for a new economic system where efficient use of resources is the focus. Circular economics aims to go beyond our contemporary linear models of take-make-waste, but eliminate waste entirely by being restorative and regenerative by design. Product and services are designed in such a way that waste from any economic process will be a resource for another process. Supported by renewable energy and a shift to a service economy that is based more on use than on ownership, it aims to build social, natural and economic capital. Circular economics tries to envision an economy where we take these planetary boundaries into consideration and decrease our negative influence on them dramatically. Circular economics claims to bring both sustainability and great economic growth: a win-win situation.

This thesis discusses the implications of climate change at the intersection of philosophy and economics. There are multiple ways to approach the subject of the relationship between climate change and human society. I will focus solely on anthropogenic climate change, or climate change that has been caused by the actions of human beings. Unless otherwise indicated I will use the word climate change to mean anthropogenic climate change.

In the first chapter, I will argue for a minimal concept of human rights to show the effects of climate change on human life, and to serve as a universal threshold for justice in the face of climate change. I will elevate this threshold by discussing Rawlsian

principles of egalitarian intergenerational justice for developed, liberal nations. As egalitarian theory deals with the compensation of involuntary disadvantages impacting a person's ability to live a decent life in society, I argue here that the effects of climate change, especially for future generations, are an arbitrary disadvantage in need of compensation.

The second chapter will focus on the institution of economics and in particular strategies of economic growth. I will discuss different strategies of economic growth and their compatibility with the threshold for intergenerational justice I have laid out in the first chapter.

I will discuss the theory of circular economics in chapter three and measure them to my philosophical and economic arguments from the first two chapters. I will argue for a distinction between a narrow definition, supported by the argument of profits, and a broad definition, supported by the argument of sustainability. I will identify an idealistic tension in the heart of circular economics, when its most influential literature talks on the one hand of large-scale systemic changes and an awareness of and balance with the ecosystem, but on the other hand keeps professing a maximisation of economic growth through policies of decoupling. I argue, therefore, that circular economics only has a chance of aiding the goals of intergenerational justice in its broad definition. Intergenerational justice such as I have defined it in this thesis is incompatible with a narrow view of circular economics.

I – Intergenerational Justice

Climate change faces us with many ethical problems, both in taking responsibility for its effects as in conceiving of solutions for environmental degradation. In this chapter I will focus on one of the central relationships of this issue: the relationship of our generation to future generations. As we have seen in the introduction, climate change has a very real effect on the ability for human society to thrive. In order to know plan our economic strategies at this point in time, we need to discuss the duties we have to future generations. These questions belong in the field of intergenerational justice. The main question I will be dealing with in this chapter is:

> What are our collective duties towards future generations in the face of anthropogenic climate change?

I will first argue for a human rights perspective, in order to show that climate change has a very real effect on people's ability to live a decent life. These human rights define what the minimal universal requirements for such a decent life should be. This perspective outlines the rights future generations have, just as much as we do. Caney's (2010) theory directly targets those effects of climate change that have the most effect on human rights, and therefore connects human rights and climate change directly. Expanding on the threshold that Caney provides, I will discuss what duties correspond to these human rights in developed nations. I will focus on the economic policies that egalitarian justice requires of developed, liberal nation states. I will argue that an understanding of intergenerational justice through a Rawlsian just savings principle in combination with Caney's (2010) human rights perspective provides us with a moral framework that is just, both concerning the individual and the collective as well as being sufficiently neutral with regards to a definition of a good life.

A. A human rights perspective

Caney (2010) takes a human rights perspective to think about climate change effects such as droughts, flooding, diseases and food insecurity. There are different ways to approach these climate change effects: firstly, in terms of security (how to defuse the security threats climate change effects pose?), secondly in terms of a cost-

benefit analysis (what is the difference between costs and benefits for business as usual on the one hand, and various mitigation and adaptation policies on the other?), thirdly in terms of ecology (in what way does climate change impact the intrinsic value of nature?), and fourth in terms of human rights. Caney argues for the latter; a human rights perspective. Caney defines human rights as those rights a person has by virtue of their humanity. In this sense, human rights are respectful of each and every individual. Both intrinsically, by virtue of being human, and instrumentally, by virtue of their ability to create welfare, human rights receive broad universal support (Caney, 2010). They are also representative of the moral thresholds that I seek in this chapter, because they represent a threshold under which people should never sink. In that sense, human rights do not provide a plan for the best possible world; they are a 'morality of the depths'. You could say they provide a recipe for the minimum requirements of a *decent life*. Moreover, they take general priority over other values, which makes them a strong framework. With this approach Caney is in line with statements from the UN and AOSIS, which have both in multiple instances expressed the grave effects of climate change on human rights (Caney, 2010).

Even though human rights represent a certain threshold, the height of this threshold is determined by the way you define that right. This is crucial, as human rights are supposed to be universally accepted moral thresholds that embody the moral standpoint but are also inclusive enough to be widely accepted. Because climate change challenges societies all over the world, Caney argues that is important to define the relevant human rights as minimally as possible. They must be acceptable from any number of different ethical perspectives (for instance, someone in favour of the death penalty will have another definition of the right to life than someone who opposes capital punishment). Another reason to define these rights so minimally is to show that even these minimal rights will be or are being violated by anthropogenic climate change. He gives these minimal definitions for the three human rights that are most directly connected to climate change: the right to life, the right to health and the right to subsistence. All other rights, such as the right to culture and the right to use and enjoy property, are supported by these three key rights. He defines these three rights as follows:

1. “The human right to life: Every person has a human right not to be ‘arbitrarily deprived of his life’;

2. The human right to health: All persons have a human right that other people do not act so as to create serious threats to their health;
3. The human right to subsistence: All persons have a human right that other people do not act so as to deprive them of the means of subsistence"
(Caney, 2010, pp. 166-168).

Climate change violates these rights in a multitude of ways, argues Caney. The right to life is violated when extreme weather conditions destroy coastal towns and cause flooding and landslides. Heat waves are also a devastating result of climate change, causing cardiovascular, cerebrovascular and respiratory problems that can cause death, writes Caney. I would also argue here that the human right to life is indirectly violated by climate change when conflicts over scarce resources result in the arbitrary loss of life in the case of civilian casualties. Hunger as a result of crop failure and a corresponding higher mortality rate can also be linked to climate change. The IPCC (2014) reports that many diseases will multiply and spread when exacerbated by the effects of climate change, such as dengue and malaria. This is, combined with the health effects of droughts and heat waves, a serious risk to the human right to health. The right to subsistence is in danger when droughts cause agriculture to fail. Flooding also has this effect, when coastal agriculture is flooded. This does not only mean that crops fail, but also that less land is available for the provision of food. Freak weather events have the same effect; the resulting food insecurity violates the human right to subsistence. These three rights are all formulated around the interactions of people (Caney, 2010). The reason for this is that anthropogenic climate change is exactly that; the result of the actions of many people, causing effects that impact other people's, and even their own, lives. This argument would not hold up, in other words, if we were talking about natural climate change.

Caney lists several reasons why he argues for this perspective over the perspective of cost-benefit analysis or security-based analysis. Firstly, where the cost-benefit perspective and security based perspective aggregate the interests of groups of people, a human rights perspective takes the distinction between persons seriously. In other words, in a human rights perspective, losses of one group cannot be compensated for by the gains of another group. This is relevant in the case of intergenerational justice, because it means that policies based on a human rights perspective ensure that

no one can fall below a certain threshold, not even future people. I will discuss this principle further below.

A human rights perspective also acknowledges that we are dealing with certain structures of responsibility; anthropogenic climate change and its devastating effects on certain communities are the product of the actions of others. A security-based perspective, for instance, overlooks the more complex issues at hand here, only focusing on risk assessment and management. Therefore, a human rights approach is capable of protecting the vulnerable, which cost-benefit analysis fails to because of its aggregative nature, and a security-based approach fails to do because it only focuses on conflicts. A human rights perspective, as I said above, prioritizes human rights over all other considerations, including risk aversion and monetary costs. The gains from a human rights perspective on related policies about mitigation of climate change effects is therefore extensive, argues Caney. A human rights perspective requires someone who violates human rights to desist, even if that is costly.

Human rights, summarily, provides us with a view of what's important to human beings in the most minimal and universal way possible; every person in every country in every generation should enjoy these human rights. Accepting this premise, we impose upon ourselves the duty to realise and uphold these rights. In the next section, I will discuss what form these duties take in democratic and liberal nation states, from an egalitarian perspective.

B. Rawlsian intergenerational egalitarian justice

Egalitarianism defines itself by its aim for redistribution of certain goods in order to compensate for involuntary disadvantages of people. There are different ways in which a person can be involuntarily disadvantaged; you could have been born blind or have a relatively low intelligence. They argue that all features of persons, like their wealth, gender, place of birth or colour of their skin, are morally arbitrary when it comes to the opportunities they should have in life. Like a human rights perspective, it argues for this equality of all people based on the intrinsic value of humanity. The egalitarian aim of redistribution also characterises their theory of intergenerational justice. This thesis will focus on Rawls' views, as he is one of the key contemporary

representatives of egalitarianism. His theory on intergenerational justice is also one of the starting points of the current debate on intergenerational justice.

Rawlsian egalitarianism distinguishes itself by the basic idea that principles of justice should be such that they would be accepted and agreed to by everyone from a position of fairness (Freeman, 2016). This initial 'fair' or 'original' position is what Rawls calls 'the veil of ignorance'. Behind this 'veil of ignorance' rational people will decide by what principles society should be governed. To ensure that their judgment is impartial, the parties are ignorant of their own and other's personal characteristics and their social and historical conditions. What they do know of are the fundamental interests they all have, and general facts about economics, biology, psychology and other social and natural sciences (Freeman, 2016, para. 1). In order to decide on these governing principles, they are given a list of all the main theories of justice from social and political philosophy. Their task is to choose among these alternatives and find the one that satisfies all of their fundamental interests. The result of this exercise is to find guiding principles for the establishment of a just 'basic structure'. This basic structure exists of institutions like the economy, the legal system and the family. These institutions are the birthplace of justice, argues Rawls, because in these institutions the main benefits and burdens of social life are distributed. This thesis focuses only on the institutions of economics, as an institution with much influence on climate change. All these institutions mentioned above determine the distribution of wealth, determine what your chances in the job market are and what actions deserve social recognition. Individual behaviour is shaped by them, because they have a profound influence on people's aspirations, attitudes and relationships. This is why Rawls focuses on institutions, instead of focussing on individual behaviour. His reasoning is that as we make the basic structure just, individual behaviour will have to follow. Moreover, just institutions allow individuals to pursue their plans in life, without having to worry about the distributive effects of their behaviour. This is called procedural justice; by virtue of just institutions, anything that happens in society within these institutions is always just. The basic structure of society is, in this way, a reflection of the fundamental equality of its citizens. Behind the veil of ignorance, people will never decide to appoint rewards for any arbitrary features. As citizens are fundamentally equal, products of collective labour should be equally divided among them. All this has the goal of allowing all persons within a society to be able to freely pursue their ideas of the good

life. That is why Rawls prioritises the right over the good in his theory of justice. Ideas about a good life are an individual issue, all society has to do is empower people to be able to pursue them in a just context.

Rawls argues that rational and reasonable persons would design the basic structure according to these two principles of justice:

1. "Each person is to have an equal right to the most extensive total system of equal basic liberties compatible with a similar system of liberty for all.

2. Social and economic inequalities are to be arranged so that they are both (a) to the greatest benefit of the least advantaged, consistent with the just savings principle, and (b) attached to offices and positions open to all under conditions of fair equality of opportunity" (Rawls, 1999, p. 266).

In deciding what course of action in governing a society is right, especially considering distribution of goods, the first principle takes lexical priority over the second principle. In other words, any measures aimed at reducing inequality cannot be at the expense of the liberties from the first principle: liberties can only be restricted for the sake of liberties. For the second principle, 2B takes priority over 2A (2A is often called the difference principle). This means that a disadvantage to the least well-off can be justified if it means we can uphold fair equality of opportunity. Now in order to understand these two principles some phrases should be explained. 'Equal basic liberties' refers to a list of basic liberties any person in a just society should enjoy. Rawls writes:

> "Important among these [basic liberties] are political liberty (the right to vote and to hold public office) and freedom of speech and assembly; liberty of conscience and freedom of thought; freedom of the person, which includes freedom from psychological oppression and physical assault and dismemberment (integrity of the person); the right to hold personal property and freedom from arbitrary arrest and seizure as defined by the concept of the rule of law" (Rawls, 1999, p. 53).

Through these basic liberties, citizens are able to form relationships based on equality. These basic liberties share some resemblances with the human rights Caney

(2010) defined above. However, we should not confuse human rights with the pursuit of justice. The requirements of justice go much further than Caney's human rights. This has often been a point of criticism in Rawls' theory; he is too minimalistic qua human rights. Nonetheless, I must argue that, regarding Caney's minimalist definitions of these rights, they would absolutely belong in a Rawlsian list of human rights. Where a human rights perspective only provides a, relatively low, threshold, Rawls builds on that threshold to create a society where institutions are capable of upholding these rights and perpetually create justice. The two principles of justice above can only be possible when the human rights to life, health and subsistence are upheld. He builds on them, so he must acknowledge their importance. Rawls writes the following about human rights in his Law of Peoples:

> "Among the human rights are the right to life (to the means of subsistence and security); to liberty (to freedom from slavery, serfdom, and forced occupation, and to sufficient measure of liberty of conscience to ensure freedom of religion and thought); to property (personal property); and to formal equality as expressed by the rules of natural justice (that is, that similar cases be treated similarly)' (Rawls, 1999, p. 65)."

The right to life that he defines encompasses Caney's right to subsistence and would arguably also contain a right to health. He defines these rights as minimal conditions for social cooperation and a marker of any well-ordered society (Wenar, 2017, para. 3). The security of these human rights forms the foundation for the basic structure of society. Like Caney, Rawls also explicitly builds his theory around the protection of the least advantaged. His aim is to provide a blueprint of a just society that both has just institutions and takes the distinction between persons seriously.

The second principle of justice deals with the distribution of wealth and goods in a society (difference principle) and the way organizations are assigned authority and responsibility (fair equality of opportunity). This distribution does not have to be completely equal. These goal of these principles is to ensure that *everyone* benefits from the gains of social (collective) productivity. Interestingly enough, 'everyone' does not only include all people within one society, but also reaches into the future, where Rawls defines the duties of contemporary people to future people. The gains of current

social productivity also belong in part to future generations. This transfer of our gains of productivity to the next generation is articulated in Rawls' Just Savings Principle.

C. The Just Savings Principle

The Just Savings Principle (JSP) is Rawls' answer to the question of intergenerational justice. Any theory of intergenerational justice, Gosseries (2001) writes, must give an answer to these three questions: "First, *what is a generation?* (…) Second, *do we owe anything to future and past people?* (…) Third, *if we do have obligations, at least to the people of the future, how should we define them?*" (p. 295). He, as well as I, will only take on the last question here. I will therefore assume that we have duties at least to future people. I will also, like Gosseries, take a generation to mean a birth cohort, or "a set of individuals born during a certain period" (2001, p. 295).

There are many different ways of defining the rights we have to future people. Gosseries discusses multiple theories, but due to space constraints, I cannot go into his discussion of these positions. Gosseries argues for the position of Rawlsian intergenerational justice, albeit with one adjustment.

According to Rawls, justice between generations lies in the way institutions deal with natural limitations such as the time difference between generations, and the ways that they can take advantage of historical progress (Rawls, 1999, p. 254). A savings principle must ensure that every generations get from their predecessors what they deserve and in turn provide for their successors: "Hence, just savings aims at achieving and preserving just institutions and the fair value of liberty" (Gosseries, 2001, p. 315). Rawls determines the rate of savings through the hypothetical original position. He asks those in the original position to decide "how much they would be willing to save at each stage of advance on the assumption that all other generations are to save at the same rates" (Rawls, 1999, p. 287). Savings can be understood as literally putting money aside, in some sort of fund, to be used in the future. It is, however, mostly about investing in technology, education and healthcare; means to create just institutions. Its goal is to develop knowledge and skills that are necessary to establish those just institutions that have a direct effect on the quality of people's lives. In other words, the JSP directs where (part of) the money goes. Because these background institutions are

supposed to work through procedural justice (just through the procedure we have put in place, which makes individual action or moral choice less important and therefore the system less precarious), you are enforcing these procedures through saving. You invest in the system so that others may benefit from the system you have created. Gosseries argues: "just savings is *just* both because it is oriented towards achieving just institutions *and* because each generation has to participate in the elaboration of this goal with a fair share" (2001, p. 315).

Rawls considers this question across societies at various stages of development. He defines two main stages in the development of nations: the *accumulation phase* and the *steady state phase*. The accumulation phase has one main goal: to reach "a state of society with a material base sufficient to establish effective just institutions within which the basic liberties can all be realized" (Rawls, 1999, p. 256). This process of accumulation therefore benefits all subsequent generations. The savings rate required here is a positive one; the current generation will have to transfer more to the next generation than what it initially received (Gosseries, 2001, p. 316). In other words, we need to save more than what we had to start with, in order to give future generations a better life than we have; better in the sense of *more just*, through just institutions. Net savings will no longer be required (fall to zero) as soon as we go into the steady state phase. A key observation here is that, according to Rawls, the transition from the accumulation phase to a steady state hinges on *material accumulation*. In other words, as soon as we have accumulated the material resources necessary to establish these institutions *and* have indeed established them *firmly*, we enter the steady state phase. Our duty then shifts from enabling future generations to create these institutions, to maintaining and preserving these institutions and the material base they require for us and future generations. This is why I argue that Western societies have passed into the steady state phase. Our western societies are defined by their huge rates of consumption and abundance of resources. The obvious conclusion from Rawls' argument is that since we have no need for further accumulation, we do not need to focus on material growth (which I will discuss at length in chapter II). This ability to maintain and preserve institutions through a sufficient material base is exactly what is jeopardised by climate change. Therefore, we should focus on putting the materials we have to good use (see the discussion in chapter III).

Gosseries argues for one important adjustment to the rules of the steady state phase: not only should dis-savings be prohibited, positive savings should be prohibited as well. Rawls worries here about the current generation leaving *enough* to the next one. Gosseries, however, also worries about leaving the next generation *too much*. In fact, he considers this a matter of justice (2001, p. 324). One reason for this, which will be discussed more extensively in chapter II on strategies of economic growth, is that too great an abundance has been shown to affect our lives negatively. Therefore, the difference principle requires us to leave the next generation with neither less than more than we initially had. This is because the difference principle in this context requires us to maximise the position of the least well-off transgenerationally, *in addition to* the worst off in the current generation. In order to maximise the position of the worst off in our own generation, it makes sense to prioritise them over leaving next generations *more* than what justice requires (e.g. more than is necessary to maintain just institutions). Gosseries argues that "[i]f there are "surpluses," they should be given in priority to the worst-off in the current generation, instead of being transferred to the next generation" (2001, p. 325). This principle, in effect, prohibits any economic development beyond the accumulation phase. However, Gosseries discusses six exceptions to this rule, dealing with demographic fluctuations, prudency about uncertain future conditions and savings for your own children. Most relevant for our discussion of climate change effects is his fourth exception. Here, Gosseries argues that, if we can show that an exogenous disaster will occur in the future, we would be required to adopt a positive savings rate once more. He defines an exogenous disaster, as a disaster which is neither caused nor possible to prevent by the current generation. This makes sense in the context of egalitarian theory, which aims to compensate for arbitrary disadvantages, which a natural disaster would be. In fact, Gosseries states that this is the only way in which genuine distributive justice is relevant intergenerationally.

I would argue, based on the complex responsibility structures surrounding the problem of anthropogenic climate change, that our knowledge of impending disaster as a result of anthropogenic climate change would warrant a positive savings rate. The nature of anthropogenic climate change is such that responsibility, in space and time, becomes a difficult issue. CO_2 emissions on one side of the world may have a devastating effect on nations a continent away, and the delayed effect of these actions

(for instance due to the fact that CO2 stays in our atmosphere for a long time) makes assigning responsibility even more difficult. In our current generations, the climate change effects we are observing have been caused by emissions from decades ago. Because of this delay we cannot be said to have caused them. Similarly, we have no way of preventing climate change effects for the next generation. Our emissions now, however, *do* have an effect on generations further removed from us. Gosseries claims:

> "We should indeed require, *ceteris paribus*, the adoption by the current generation of a *positive rate of savings* such that the next generation will not find itself more disadvantaged than the current one."

I would interpret this disadvantage, for which savings is a solution, as the need to invest in mitigation and adaptation policies. This is a disadvantage that the current generation has neither caused (because even earlier generations have caused it) nor is able to prevent (because mitigation and adaptation will be necessary for multiple generations to come). Moreover, it is a possibility that future generations will adopt a sound climate policy, while still facing the effects of our current pollution. Because of these considerations, I argue that the effects of climate change can be seen, although not quite a completely exogenous disaster, certainly as an arbitrary disadvantage in need of compensation and therefore a positive savings rate. The impact that climate change has on intergenerational justice should afford it a place in Gosseries' list of exceptions to the zero-sum savings rule.

The reason that I argue for a positive savings rate, instead of appealing to the steady-state rule of maintaining just institutions, is as follows.

We have established that we are currently in the steady-state phase because of our plentiful resource base. That means we have two avenues of action open to us for enacting a policy that will aid us in achieving intergenerational justice in the face of climate change. First, we could argue that, as we are in a steady-state, a positive savings rate is not allowed. Adapting to climate change would then fall under the task of maintaining just institutions, as stated by Rawls. Alternatively, we could argue that climate change and its effects on society fall under the list of exceptions that Gosseries has detailed, which makes it eligible for a positive savings rate. This would mean a situation where savings are positive, but accumulation is zero. A policy of savings would detail how much should be saved and where the savings are supposed

to end up. As I have stated before, Rawls defines these savings as critical investments in technology, education, etc., which will make just institutions possible, now and in the future. As Gosseries argued, a policy of savings is just because every generation has to put in its fair share. These two options are shown in Table 1 below, where the "Yes/No" answer for savings in the steady-state phase indicates on one hand the rule Rawls employs of no savings in the steady state phase, and on the other hand the exceptions that Gosseries has detailed of situations in a steady state which warrant a positive savings rate.

Table 1. Characteristics of Rawls' accumulation phase vs. Rawls' steady-state phase

	Accumulation phase	Steady-state phase
Accumulation	Yes	No
Savings	Yes	Yes/No

Note. A characterisation of Rawls' two phases of development based on their incorporation of a positive savings rate and/or an accumulation process.

Although the outcomes of these two avenues of policy should be the same, I nevertheless argue that it has merit to reason for a positive savings rate over a policy of maintaining our current institutions, because the latter does not express the necessity of a complete overhaul of our current economic institution (which I will argue for more extensively in chapter two and three) to adequately respond to the climate change challenge. Allowing for a specific rate of savings (decided upon behind a veil of ignorance), intended to make sure justice in the current and future generations will not be impacted by climate change, would provide more of a policy focus and, in my eyes, a stronger obligation towards accomplishing this goal. This does not mean, however, that we do not have duties of intergenerational justice towards generations further removed from us. In fact, the adoption of a positive savings rate makes sure that resources are used efficiently in the advancement of the aim of intergenerational justice. Circular economics (as discussed in chapter three), furthermore, provides a blueprint of a system where savings without accumulation are made possible.

D. The Metric of Justice

So far, we have only discussed in what way justice can be attained. Egalitarian justice puts equality central stage, which means that we need to answer the question: Equality of *what*? What should this generation leave to the next? There is a range of answers to this question, writes Gosseries (2001, p. 337), from a subjectivist notion of welfare to an objectivist notion of resources (such as land, vegetation and animal

life). Lack of space prevents me from making an elaborate analysis of this issue, such as can be found in Gosseries (2001), but in support of my argument I will make my assumptions explicit below.

The metrics problem we are dealing with regarding climate change is that we need to find a way to make sure that what we leave future generations is equivalent to what we received, even though the contents of this 'basket' we're transferring is very different (Gosseries, 2001, p. 340). In other words, because we are using up non-renewable resources, we might be depriving future generations of the functions of these resources. A savings policy such as I have suggested above aims to solve this problem, by providing relevant substitutions. Gosseries asks himself the question: "to what extent would a generation be entitled to make up for the depletion of natural/physical capital (e.g. oil) by increasing human capital, e.g., by providing new technologies and investing in education (potential technology)" (p. 342)? I would argue in response to this, that we can only deplete resources to the extent that the process in which those resources are used creates sustainable alternatives that make us less reliant on, for instance, fossil fuels. Ergo, this is where much of the process of saving would happen.

The problem then becomes, whether the substitutes are able to provide future generations with the same outcome. Therefore, I will assume a welfarist position for the purposes of this thesis, which states that resources are valuable to the extent of the welfare that they provide. I have defined social welfare through Raworth's social foundation, containing elements such as housing, education, political voice and gender equality. I would argue that resources are valued in a comparable way by Rawls, when he states that material resources are a requirement for the establishment of just institutions. Natural resources, in this way, through their contribution to social welfare, serve a purpose of justice.

E. Conclusion

In this chapter I have taken up the question of our collective duties towards future generations, in the face of anthropogenic climate change. I started by connecting climate change effects directly to human rights, showing how deeply climate change can and will impact human society. I have associated these universal rights, as a way

to connect climate change effects to matters of justice, to the egalitarian interpretation of intergenerational justice that I have argued for. The principles of Rawlsian distributive justice led us to the just savings principle, as determined by the participants in Rawls' original position. The nature of anthropogenic climate change, as I have argued, is such that its effects can be considered worthy of a place in Gosseries' list of exceptions to the zero-sum savings rule. I have subsequently argued that this avenue of policy is to be preferred over Rawls' steady-state rule of no savings because it has more potential to make our society 'shift gears' and make actual change in economic institutions happen. This means that it becomes a matter of justice to adopt a positive savings rate to make sure that we will transfer to future generations the required material resources (natural resources, technology, etc.) and immaterial resources (knowledge etc.) to adopt necessary policies of mitigation and adaptation to climate change. This is essentially a welfarist notion, where resources are valued to the extent of their contribution to social welfare.

In summary, we have adopted Rawls' principles of justice and identified the following additional requirement for intergenerational justice regarding the climate change challenge:

1. We are obligated to maximise the position of the least well-off intergenerationally by adopting a positive savings rate.

In the following chapter, I will discuss what these duties of justice require of our economic growth strategies and argue for an agnostic growth policy. In chapter III, I will argue that circular economics provides a direction for these particular positive savings in the form of education and technology about how to produce and consume more sustainably.

II – Economic Growth

In the previous chapter I have argued for an egalitarian view of intergenerational justice. As we decide what duties we have to future generations and what savings rate we should use, the subject of economic growth becomes important. In contemporary western economies, economic growth is regarded as the ultimate goal of the economy; high rates of economic growth are celebrated, slow growth is feared. In other words, we have grown comfortable with the process of accumulation. So much so even, that we have begun to view this economic growth as the sole purpose of society (Sedlacek, 2011). Rawls writes the following:

> "It is a mistake to believe that a just and good society must wait upon a high material standard of life. What men want is meaningful work in free association with others, these associations regulating their relations to one another within a framework of just basic institutions. To achieve this state of things great wealth is not necessary. In fact, beyond some point it is more likely to be a positive hindrance, a meaningless distraction at best if not a temptation to indulgence and emptiness." (Rawls, 1999, pp. 257-258)

It seems that we have adopted policies which assume exactly that: economic growth leads to social welfare. Erroneously so, if Rawls' remarks are taken into account. True social welfare, in his theory, comes from creating a society which upholds his principles of justice. Ensuring these basic liberties, fair equality of opportunity and redistributive policies, as the basis for *equal* welfare, are in place for future generations to enjoy, requires Rawls' just savings principle. He states: "(…) we are not bound to go on maximizing indefinitely" (1999, p. 257). There is a clear goal to the endeavour of growth and a clear Rawlsian path to take. This very much clashes with how we have been conducting our economic business over the past few decades. Because of advancements we have made on the agricultural, industrial and technical front we have been able to produce goods to such a scale and for such a low price that luxury goods have been made available for large groups of people. We have linked to this a view of welfare that is, in many ways, very narrow. In our western economies, we do not suffer from our inability to control our impulses; we are *encouraged*

through commercials and in our relationships. This all stands in stark contrast to what Rawls' argues. He writes:

> "Saving is achieved by accepting as a political judgment those policies designed to improve the standard of life of later generations of the least advantaged, thereby abstaining from the immediate gains which are available" (Rawls, 1999, p. 258)

The Rawlsian argument would therefore be that maximization can never be allowed, not even if it is corrected for the rate of savings necessary for that stage of development. As Gosseries argued, as soon as we have entered the steady state stage, we can no longer defend dis-savings *nor positive savings*, because abundance has a negative effect on our welfare. At first glance this seems a strange statement, but abundance can lead to greed which, supported by neoliberal capitalist policies, can steer the economy in neither a socially nor environmentally responsible direction. Namely, abstaining from the immediate gains Rawls mentions above is exactly what we have not done. It is clear that anthropogenic climate change arose from our preoccupation with wealth through productivity growth. We have kept on accumulating, but we haven't been using this productivity in such a way that climate change will not affect our ability to provide just institutions for future generations. In order to ensure these just basic institutions for future generations, we need to adopt an economic policy that is sustainable and will keep us safely within the planetary boundaries. In this thesis, I will regard our responsibility towards future generations regarding the environment as a means to creating welfare for ourselves. These limits to growth will be explored in this chapter. The central question of this chapter is:

> What strategy of economic growth fits best with Rawlsian egalitarian principles of intergenerational justice?

Where the last chapter took on the relationship between our current generation and future ones, this chapter aims to evaluate current macroeconomic policy and its ability to perform the intergenerational duties we have defined. In order to do this, we will first focus on the nature of our focus on economic growth, starting by defining economic growth. Then, I will argue that the mainstream assumption of a direct relationship between economic growth and social welfare is wrong and has grave consequences for issues like inequality and actual social welfare. I will then connect

the pursuit of economic growth to environmental welfare as an important factor in human thriving. I will argue here that the popular strategy of maximal economic growth is a dangerous one. Instead, I will argue for Van den Bergh's strategy of *a-growth,* or agnostic growth. My argument will show that we do not need to condemn growth *per se*, because it has certain merits. Instead, we should plead for a strategy of economic growth that is more in line with the requirements of egalitarian justice.

A. Defining economic growth

Sedlacek (2011) argues that one of the most persistent beliefs in our society is that wealth (more money) will bring us welfare and therefore happiness. However, this connection between earning more money and experiencing more welfare seems a strenuous one. Many philosophers and economists alike have argued against this proposed causality. Essentially, it is the belief that consumption through free markets causes social welfare. The prevalence of this belief becomes clear, for instance, when we look at the reactions to the economic crisis of 2008, when the financial system collapsed under the weight of the bursting housing bubble. Ever since the collapse, the media has been filled with voices calling for a reinvigoration of the economy through economic growth. It is, of course, evident that a crisis such as this has a negative effect on social welfare. In many countries, it led to severe government cutbacks, a decline in purchasing power of households, the bankruptcy of many companies and a rise in unemployment. While it holds true that a dramatic decline in economic growth, such as we saw in 2008, has a negative effect on social welfare, it is not necessarily true that the cure for these problems is to strive for renewed economic growth.

As I have stated in the introduction to this thesis, the definition of economic growth I will use here is the growth of productivity, or Gross Domestic Product. The phrase 'economic growth' can refer to many things, but always refers to a positive development of financial income in a nation. For instance, you can talk about growth of consumption or growth of the physical size of the economy in terms of resource use. Most often though, in mainstream media, by politicians and economists, it is used to signify gross domestic product or GDP. GDP is the aggregate measure of all formal markets in a country. In this number, the market value of all goods and services consumed by households, government bodies and foreigners over one year within one nation are combined (Daly & Farley, 2010, p. 266). In other words, when the economy

grows this generally means that incomes rise and purchasing power increases. In its most simple form, sufficient for my discussion of the subject here, economic growth is calculated with this formula:

$$GDP = C + G + I + NX$$

Here 'C' represents private consumption or what households spend, 'G' is government spending, 'I' is all domestic investments and 'NX' is the total of net exports, where all imports are subtracted from all exports. This gives us the GDP of a country. What we usually talk about to signify growth is the GDP calculated per person, or 'capita', in that country. We get the GDP per capita when we divide the total GDP over the number of citizens of a country.

B. The connection between social welfare and growth

GDP per capita is used as an indicator of progress and welfare across the world. It is the standard unit of measure in studies done by the International Monetary Fund, the World Bank, the United Nations and many others to calculate relative wealth in countries worldwide. Moreover, it is used to signify *the relative social welfare of countries*. In the past half century, however, using GDP per capita as a measure of social welfare has been widely criticised (most notably in the relatively new economic field of ecological economics) for not being an accurate indicator for human welfare and progress (Van den Bergh, 2009). As I mentioned in the introduction, I have defined social welfare as Raworth's (2017) social foundation for justice. For all of the elements that come into play there, such as political voice, gender equality and education, none of these seem to be strictly the product of the consumption of private market goods. Van den Bergh calls this the 'GDP Paradox'; even in the face of much criticism, GDP per capita continues to be used around the world. It has become somewhat like a fact of life in economics, writes Van den Bergh. The criticism is accepted, but its relevance is denied. This means that mainstream economists hold a rather ambivalent position, believing that economic development and its social optimality isn't much impacted by the shortcomings of this indicator. There are two main areas of criticism for this indicator. First, that there is a discrepancy between what we *think* GDP measures, and what it *actually* measures. Second, and consequentially, that there is a discrepancy between what we think GDP

growth will bring us, and what GDP growth actually brings us. Moreover, in believing in the GDP indicator in this way, we have made a common mistake; we have elevated the position of GDP from a means to a goal in itself.

1. GDP as a measure of social welfare

In many ways, the GDP indicator fails to provide the information we assume it provides in mainstream theory. There are different reasons for this discrepancy, I list three of these reasons below.

Omitting externalities

The assumptions underlying the measurement of GDP are its first problem, writes Heath (2002). At the core of this indicator he distinguishes three maxims: first, consumers are never satiated, second, preferences are fixed and third, consumption doesn't generate externalities. This represents the welfare economists' theorem where a strong connection between welfare and markets is assumed (Heath, 2002). Especially the third assumption has monumental consequences: when externalities of productivity are ignored, it is possible that negative externalities completely outweigh the benefits of production. If we do not take this into account in our calculations, we end up with a seriously distorted picture of reality. Only some of the costs and benefits of productivity go into calculating GDP. An important example for our discussion is the omission of costs to the environment. When companies dump their toxic waste in rivers, killing wildlife and endangering public health, it shows up in their books as a cheap way to get rid of their waste, lowering their costs and thereby raising the GDP per capita.

No distinction between types of goods

This brings us to the next problem: GDP can only measure those things we have been able to translate into monetary value. Many, and arguably most, things that impact our social welfare significantly cannot be expressed in money. The value of a person's access to nature, for instance, cannot be quantified because it is inherently subjective. Other important factors for social welfare could be the access to safe mobility, freedom of religion and a respectful public space. In fact, many researchers argue that these factors have more impact on social welfare than income. Yet they are not taken into account in the calculation of GDP. Moreover, and even if these factors

would be accounted for in GDP, as an aggregate measure it assumes that a rise in material goods and purchasing power has the same impact on social welfare as public goods like access to nature or respect. Also, it assumes the same status for basic goods as for luxury goods. In other words, GDP does not distinguish between different types of goods and their relative impact on social welfare.

Ignoring the impact of distribution on social welfare

Another distinction it fails to make is in the distribution of wealth. As the measure GDP per capita suggests, the total GDP is divided by the number of inhabitants of a country. A calculation such as this hides all indications of the distribution of wealth, and supposedly welfare, over a nation. Pareto-efficiency is often used as an argument for measuring GDP, as a high GDP is an indication of high Pareto-efficiency gains, argues Heath (2002). Pareto-efficiency is essentially an optimal state of allocation, where no action can be taken to make one agent better off, without making another agent worse off. However, Pareto-efficiency does not take distribution effects into account either. Therefore, it is not clear *where* in society Pareto-efficiency gains end up. If these gains fall on only one stratum of society, this would be regarded as a gain for all of society. This way of measuring social welfare would clearly not do well in a Rawlsian egalitarian theory of justice. If distribution is not taken into account, there is no knowledge of whether the difference principle (maximising the position of least well-off) is being satisfied. It also does not tell us whether fair equality of opportunity (the equal access to positions of authority) is practiced. In other words, GDP fails to be an indicator of justice as well as social welfare. If the GDP indicator is used as the ultimate way of assessing a nation's progress, as it is today, this is worrisome from the perspective of justice.

Still, as we have said, this does not convince mainstream economists. The omission of these subjective factors does not, they argue, impact the value of this indicator significantly. In other words: *it's accurate enough*. But, when we start looking at the consequences of using this indicator, it becomes clear that these faults impact the economic outcome to a great degree.

2. GDP growth as a goal

Van den Bergh (2009) argues, that GDP is not only “an inadequate proxy of social welfare but also has a considerable impact on public and private economic

decisions" (p.121). This means we are dealing with a serious information failure. In fact, he argues that a focus on GDP is a large cause of economic instability.

Economic policy across the world mainly focuses on maximisation of GDP growth. When we talk about this maximization it is important to acknowledge a broad and narrow growth goal. The narrow goal takes purely the economic or monetary advantages as its goal, where a broad conception of maximizing growth is really about maximizing welfare. Usually, societies aim for this broad sense of maximization (De Mooij & Van den Bergh, 2002). The fallibility of the GDP measure as an indicator for social welfare, as argued above, calls this relationship between GDP growth and social welfare growth into question.

Heath (2002) argues that GDP growth *can* have these broader benefits, but not in all circumstances. We return here to the paradigm of the welfare economics' theorem. In this paradigm, Heath distinguishes a number of assumed benefits from economic growth. Growth is supposed to ensure (i) increased leisure time, (ii) customer satisfaction, (iii) the abolishment of poverty and (iv) decreased social inequality. The reigning idea in the 1950's was that people, as they became more affluent, would become less possessive and therefore more inclined to share. This would lead not only to alleviation of *absolute* poverty (less people living below the poverty threshold), but also of *relative* poverty (income inequality). Sadly, writes Heath, these predictions did not come true: "While the standard of living has risen quite steadily, there is no evidence that this has led to any lasting gains in welfare" (2002, p. 229). He equates the term 'standard of living' here with a rise in income. Not only is this the result of diminishing marginal returns in reaction to increases in consumption (meaning that the wealthier people get, the less their welfare will be affected by raising their income), but no correlation can be found between welfare and consumption beyond a certain income level. This observation is called the 'threshold hypothesis'. Above this threshold, increasing someone's income will not significantly impact their welfare. In fact, as Daly (1991) argues, the costs of raising people's incomes above this threshold exceed the benefits.

To explore what effect growth has on an economy, two factors are important: the affluence of a society at a certain starting point, and within that society the areas where economic growth is happening. Heath (2002) argues the following:

1. Developing countries, or countries where the income level is below the hypothetical threshold, benefit greatly from economic growth. Developed societies with an income level above the threshold do not.
2. Some types of consumption have a positive impact on social welfare, where others do not.

3. Consumption and social welfare

Contrary to the predictions of the welfare economics' theorem, increased *absolute* consumption does not lead to increased customer satisfaction. Health calls this the proliferation of desire; the process of satisfying our current desires creates new desires. This is also an important theme in Greek moral philosophy, where hedonism is criticized because of this very idea. Not only does satisfying desires create new ones, they argue, but every new desire becomes more difficult to satisfy. It would make more sense, then, to moderate these desires. This corresponds with Sedlacek's (2011) view that consumption, and the focus on growth of consumption, has become like an addiction. Like with an addiction, "we experience pleasure only from changes in our consumption, and not from its absolute level" (Heath, 2002, p. 232). Easterlin (1996) also argues that as the level of consumption rises, so do our expectations, resulting in a *zero-sum gain* in satisfaction; the satisfaction of a fulfilled desire is compensated by the subsequent desire for more of that thing. Not only does this not lead to social welfare, it also does not satisfy the Rawlsian requirements of justice. Justice requires policies of redistribution that are completely absent from an economic policy of maximal growth.

Where *absolute* consumption or income doesn't seem to have an effect on social welfare, *relative* consumption and income does. Relative consumption deals with *intrinsic* versus *social* properties of goods. In mainstream theory, the proposed rise in happiness from consumption is linked to the *intrinsic* properties of goods; the goods in themselves satisfy a desire and that satisfaction generates happiness. But, as we have just seen, that link is not there. However, *social* properties of goods do have an important effect on happiness according to Heath (2002). We mostly value goods based on their social properties, he argues, which encompasses factors such as "consumer's status, class, upbringing and aspirations" (Heath, 2002, p. 232). These factors communicate the position a person has in a social hierarchy. The problem that arises here, which plays into the proliferation of desires, is that these hierarchies have

a *zero-sum structure*. This type of consumption generates negative externalities; for one person to gain in status, other people in effect will end up with a relatively lower status. In other words, because it is all relative, what constitutes as a "nice" car is determined by the cars people around you own. What you consume is based on what goods are considered (above) average in your community. It also means that as soon as others around you buy that same car that gave you a rise in status, your initial rise in status is gone. Because relative consumption determines your status, it communicates more about social welfare than absolute consumption. Heath calls this *competitive consumption*. Related to this is *defensive consumption*. Defensive consumption does not arise from a desire to rise above others, but the desire to keep up with others. This type of consumption does not correspond to social welfare, as it is just a reaction to the negative externalities generated by surrounding competitive consumption.

Because the consumption of these types of goods do not generate welfare, Heath calls this *non-productive* consumption; consumption that does not impact welfare positively. Another type of non-productive consumption is the consumption of *positional goods*. Positional goods are goods of which the availability is fixed. For instance, a positional good is a house with a view of the sea. There is a fixed number of lots facing the sea, therefore acquiring these goods does not depend on the overall level of wealth, but on one's relative ability to pay (Heath, 2002, p. 234). The same zero-sum logic applies here, but the comparative nature of consumption does not. Only *relative* wealth has an effect on your ability to pay for a seafront property, because as economic growth makes incomes rise, it also raises the value of these properties. Generally speaking, the difference between rich and poor people in poorer countries is often determined by access to certain basic material goods like water, food and shelter. This inequality can be decreased by increasing production, giving more people access to basic goods. When a society becomes more affluent, however, the largest source of inequality between the rich and the poor revolves around these positional goods. The rich have access to these by virtue of their relative wealth. Therefore, economic growth can never decrease this inequality, because as GDP rises, all incomes rise and the relation between these incomes stay the same. Any possible increase in welfare has much to do with the instrumental character of the consumption of positional goods. For example, the positional good of living within easy distance to nature and the city is obtained by buying a house in the suburbs. If many people desire this positional good

the consumption of these houses will increase, which causes new suburbs to be built. This could decrease the access to nature for the original neighbourhoods, devaluing the initial rise in welfare but showing up as a rise in GDP because of increased production of houses. Additionally, if a family is forced to move to a suburb further removed from the city, decreasing their access to the city, they may need to buy a second car for commuting to work. This instrumental and defensive purchase decreases their welfare, but shows up as increase in their wealth. Competitive, instrumental and defensive consumption cannot be deemed productive because although they consume goods, they do not have a positive effect on social welfare. The macroeconomic objective of growth, therefore, does not satisfy principles of justice in developed countries as Rawls (1999) has defined them. In this policy of maximisation, there is at best an illusion of a regard for the least well-off, in the deluded conviction that growth benefits everyone equally. As welfare mostly hinges on relative consumption and wealth, redistribution of these goods would make much more sense in alleviating these inequalities.

This tendency to view non-productive consumption as productive explains our gross overestimation of economic growth. Coming back to the question of what economic growth actually measures, Heath distinguishes between three different types of goods. These are (i) private goods, bought and sold through the market, (ii) public goods, which are provided to us by governments and paid for through taxes, and (iii) club goods, which are provided collectively within organisations. According to the arguments above, these goods can then be divided into (i) material goods, which number can be expanded, and (ii) positional goods, which have a fixed quantity. GDP growth, argues Heath, tracks only the growth of material private goods and some material club goods. As Heath pointed out before, material private goods are also subject to diminishing marginal returns. As the strategy of maximal GDP growth only aims to increase the set of private material goods available, we can have satisfied our urgent needs for these goods but still have unresolved needs for goods the market can't supply. We may continue to consume more, even though we would rather spend our money on things the market doesn't sell. Heath argues that it is therefore not clear that money spent on maximizing GDP growth is not better spent on the provision of public goods.

One other important argument for growth is, of course, our competitive position in the world market. Heath writes, however, that quality of life may rise, even as relative standard of living (in terms of private material goods) drops. These are not

necessary correlated, as is assumed. Therefore, there is no need to worry about falling behind in terms of private material goods. Moreover, welfare of the citizens of one nation isn't impacted much by the purchasing power of citizens in other nations, because they only compete internally for positional goods.

Heath concludes that there is no reason to prefer economic growth over increased regulation for improving social welfare, possibly in the form of Rawlsian egalitarian principles. It is not clear that private material goods will provide people with the social welfare they seek, and the omission of externalities from the calculation of economic growth means that we have no insight into the *real* social welfare benefits certain goods provide. Heath proposes we look for different strategies such as internalizing externalities, providing more job security, providing more public goods, managing access to positional goods and promoting leisure. All of these measures are focused on increasing the efficiency of our economic system in its pursuit of social welfare. There is no reason to give economic growth lexical priority, or to try to maximize it. Redistribution could prove to be much more powerful and much more capable of meeting the requirements of justice.

Arguments for redistribution

Heath argues that all significant improvements in the situations of the poor in developed nations can be attributed to redistributive policies by governments, not growth. Examples of these types of policies are social health care plans and pensions. However, he suggests that resistance to these types of policies has been rising. The threshold hypothesis comes back into play here. Under a certain GDP threshold, a society simply does not produce enough to gain anything from redistribution of goods. Economic growth provides these necessary goods. This aligns with Rawls' view that societies need a certain level of resources to be able to establish just institutions. Below that threshold, societies remain in the accumulation phase. He did add to this that not many societies today are in such a position that they need accumulation. It seems more an issue of making more effective use of the resources and, as he writes, actually governing the state reasonably and rationally. As a society climbs above that threshold, Heath (2013) argues, we transition from a material into a positional economy. In that scenario, redistributive polices such as Rawls' have more potential for changing the position of the poor. This does not mean, writes Heath, that economic growth is useless. In fact, zero or negative growth only exacerbates distributive conflict, and so

does not allow for redistributive policies to take effect. With redistributive policies, you always generate winners and losers, and so will always encounter heavy resistance from the most affluent. Economic growth relaxes this resistance somewhat, argues Heath. These social tensions spring mostly from *loss aversion*; people will be much more upset to find out that they have to pay five hundred dollars more in taxes than they expected, than they would be happy to find they had to pay five hundred less than expected. This means that redistribution under conditions of *slow growth* would only take hypothetical money out of people's pockets and therefore avoid triggering loss aversion. What I think is important to consider here, however, is that making room for those redistributive policies through growth does not encourage people to use that space in that way. Economic growth does not, as was theorised, make us less possessive. In fact, quite the opposite is visible (Sedlacek, 2011). Gosseries makes much the same argument, when he states that allowing for a positive savings rate in affluent countries will not benefit social welfare. In fact, an economy so focused on growth cannot, by Rawlsian standards, produce social welfare or a just society, because its priorities are wrong. For example, this means that companies who are doing well are not contributing in such a way to society that it benefits the least advantaged. The government should have a correcting role here in Rawls' view, but in reality, contemporary governments often do not correct for this profit maximisation. Moreover, in a society where the government would take up these roles, profit maximisation would make no sense, if only to give more to other people.

C. Growth versus environment

Having discussed the profound impact that strategies of economic growth have, or don't have, on social welfare, it is time to add the climate change dimension. The goals of a maximum growth economy do not seem to have a positive impact on social welfare on the whole. Climate change puts this social foundation at even more risk, and maximum growth strategies, as I will argue below, only play into these effects. Heath (2002) writes:

> "There is clearly enormous room for improvement, most obviously when it comes to the environment. Even if one does not believe that catastrophic environmental collapse is imminent, the mere risk of inducing such a collapse is difficult to justify when these risks are being

> run in the service of a growth policy whose welfare gains have become either negligible or non-existent" (p. 238).

An ethical consideration of climate change focuses on the moral relationship between human beings in their society with regard to the ecosystem they live in. The question about how to deal with climate change is therefore a question of justice. How does the factor of climate change, or our relationship to our environment in general, impact our social welfare? As discussed in chapter one, in philosophy the field of climate ethics concerns itself with this question (Gardiner et al., 2010). From the economic side, this is the field of ecological economics. This field argues for different economic aims and assumptions, better adjusted to our ecology. It is a fusion of economics and ecology and starts from the axiom that human society is part of the natural world (The Economist, 2015). This basic assumption changes the way this field of economics looks at our macro economy and about the ways that we can create social welfare. They are often suspicious of GDP as a measure of progress, arguing for more holistic measures such as the Genuine Progress Indicator (GPI). This indicator supplements the GDP measure with non-market services generating welfare and the deterioration of natural resources. A survey at the Association of Environmental and Resource Economists (AERE) shows that much consensus exists among environmental and ecological economists about macro-economic issues such as the effect of economic growth on the environment (Haab & Whitehead, 2017). This result shows, as we have seen above, the uncertain value of economic growth even in the economic discipline. Expanding on this topic with a focus on environmental effects, the Environmental Kuznet's Curve, as shown in Figure 3, is interesting.

Figure 3. Environmental Kuznet's Curve

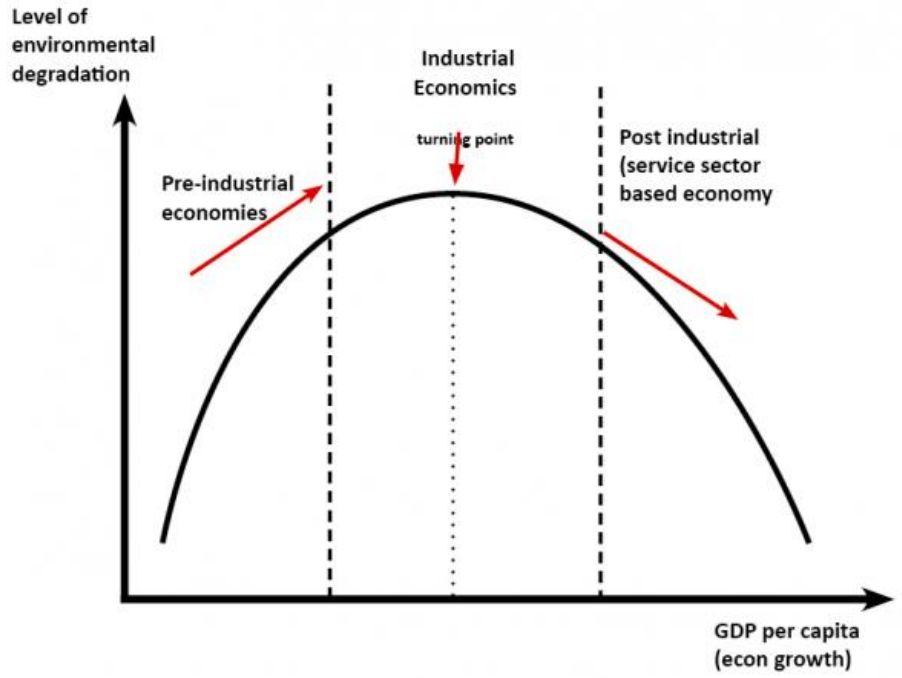

Figure 3. Graph of the Environmental Kuznet's Curve, showing that environmental degradation will rise with economic growth until a certain turning point, when it will diminish again. Adapted [reprinted] from "Environmental Kuznet's curve", by T. Pettinger, 2015, *EconomicsHelp.org*. Copyright 2016 by "EconomicsHelp.org"

The Environmental Kuznet's Curve (EKC) suggests that "in the early stages of economic growth degradation and pollution increase, but beyond some level of income per capita (which will vary for different indicators) the trend reverses, so that at high-income levels economic growth leads to environmental improvement" (Stern, 2003). In other words, the EKC suggests that growth is, eventually, in balance with the environment. The curve was initially developed in the 90's and corresponds with the views of the World Commission on Environment and Development (1987) in the report *Our Common Future,* which argues that economic growth is necessary for sustainable development (Stern, 2003, p. 2). The influence of this report can still be seen. For instance, the European Union has both the policy goal to realise an economic growth of three percent, while also committing themselves in the Amsterdam Treaty to making policy decisions based on the aim of sustainable development (De Mooij & Van den Bergh, 2002). This seems to be a conflict of interests, fuelled by the fact that the common definition of sustainable development (discussed in the introduction) is open to multiple interpretations. However, as I have argued above, this all depends on what

this economic growth is based on. It has been shown that the EKC has a very shaky empirical base; there is no robust evidence that this curve represents reality (Stern, 2003). In fact, Van den Bergh (2011) argues that growth can be a part of a sustainable economy, but only under stringent environmental policies and a general public willingness to consume sustainably.

What exactly this relationship between growth and the environment is, continues to be subject of debate among (ecological) economists. De Mooij and Van den Bergh (2002) have summarised this ongoing debate around three questions: "(i) Is economic growth desirable? (ii) Is sustainable economic growth feasible? (iii) And is sustainable economic growth or zero- growth enforce-able?" (idem, p. 84). These questions have produced the five most common positions in this debate, shown below in Table 2.

Table 2. Perspectives on sustainable economic growth

	Desirable	Feasible	Enforceable
Immaterialist	No	Yes/no	Yes/no
Pessimist	Yes/no	No	Yes (zero growth)
Technocrat	Yes/no	Yes	Yes/No
Skeptic	Yes	Yes/No	No
Optimist	Yes	Yes	Yes

Note. Reprinted [adapted] from "Growth and the Environment in Europe: A Guide to the Debate", by De Mooij & Van den Bergh, 2002, *Empirica, Vol. 29,* p. 84. Copyright 2002 by "Kluwer Academic Publishers"

De Mooij and Van den Bergh (2011) have found that the desirability of economic growth largely depends on the (social) preferences of the person you put the question to, whereas the feasibility of it depends on someone's ideas about technological advances and views of our ecological system, and their view on the enforceability of growth depends on what they think households and institutions are capable of and willing to do. I will summarize what defines these perspectives respectively.

The *immaterialist* questions whether economic growth will bring us closer to our social goals. They represent the view that economic growth does not bring us

higher social welfare. That means that if economic growth has negative environmental effects, we should avoid it altogether.

The *pessimist* holds that economic growth, desirable or not, cannot be sustainable. A growing economy always results in environmental degradation through pollution and resource depletion, giving clear limits to growth. These negative effects on the environment are considered irreversible; ecological disaster will be followed by economic disaster if we continue to grow.

The *technocrat*, however, is convinced that through technological advances our economy can continue to grow indefinitely. This view emphasizes that the composition of an economy has great impact on the compatibility of growth and environment. They argue that we have to distinguish between the value of products and their physical makeup. An economy can continue to grow without growing physically, if we assign value to things other than physical stock. Substitution of resources and an optimal use are central to this view. Developing new technologies and a shift to a service economy are also important elements.

The *sceptic* is mainly critical of the capability of societies to institute sustainable policies. Arguments for this perspective are that the desire for growth is inevitable and that democracy is imperfect due to the short-term focus of governments, where environmental problems require long-term thinking. This results in a failure to create institutions that will make a sustainable economy possible.

The *optimist* believes in the validity of the Environmental Kuznet's Curve. As incomes rise, rich consumers will invest in cleaner products because the environment has become a luxury good. The belief is that, as we become wealthier, we become more willing to support stringent environmental policies, adding to the list of benefits from growth that the welfare economists' theorem argues.

The heated debate on this topic shows how dominant the idea of economic growth is. This makes sense; because of the mainstream focus on maximisation of economic growth, challenging assumptions about growth is an important subject for ecological economists. De Mooij and Van den Bergh (2002) argue that policymakers should be aware of the existence of these different perspectives and reflect on them in their policy decisions. Politicians most often reason from an assumption that growth is a necessity, which is what Van den Bergh (2011) advises against. This is why Van den Bergh argues not to emphasize *growth* but instead focus on *sound climate policies* in order to obtain social welfare.

D. Green a-growth

Van den Bergh (2011) proposes this non-focus on growth as a sort of neutral middle ground in this debate. He calls this the idea of 'green a-growth'. The concept of green a-growth is essentially a proposition for a different strategic policy focus. He proposes to ignore the information GDP per capita provides, instead taking a neutral stance towards economic growth. His research shows that if we don't steer for growth we will still achieve it, though not at the expense of social welfare. He summarizes his view not as opposing GDP growth *per se*, but as opposing the GDP indicator. His theory is largely in reaction to theories of degrowth. Van den Bergh warns us against going from 'GDP fetishism' to 'GDP degrowth fetishism'. His arguments align with Heath's plea for slow growth that I mentioned above. To recapitulate, Heath argues that zero or negative growth would be an obstacle in the way of redistribution, because it exacerbates distributive conflict. Degrowth is the theory that, as GDP growth has been linked to environmental degradation, a negative rate of growth (or shrinking of the economy) would return balance between economics and ecology (Kallis, 2011).

Van den Bergh argues, however, that a strategy of degrowth has many pitfalls. He writes:

> "The direct, short-term effect of reduced GDP growth may be, for example, fewer CO2 emissions as aggregate production falls. However, the long term effect is uncertain, as GDP degrowth may depress investments in cleaner technologies, renewable energy and related research, which can lead to an increase in future CO2 emissions. Even the short-term effect is uncertain, as production during a period of crisis may well shift to cheaper, dirtier techniques. Moreover, as is illustrated by recent events, both governments and firms are likely to pay less attention to environmental considerations and policies during a period of crisis" (2011, 882).

Van den Bergh argues for a more nuanced view. This is what green a-growth provides. Van den Bergh states: "If one accepts that GDP (growth) is not a robust, reliable indicator of social welfare (progress) then the only solution is to ignore it and as a result be completely indifferent about GDP growth" (2011, p. 885). He argues that, because of the inefficiency of GDP growth as a social goal, we should remove GDP

information from the political and macroeconomic debate. Growth as a social goal only frustrates good policy, such as climate, health and labour policies. If we do not know whether our GDP is growing, but just focus on whether social welfare is growing (using different indicators), we would use our funds much more efficiently, he argues. In other words, you pursue certain societal goals other than growth, without considering what it does to our growth rate. The effect of this will be that growth will earn its rightful place as one among many factors which impact social welfare.

The result of the strategy of a-growth is shown in Figure 4 below, which shows the social welfare implications of the different growth strategies. The horizontal axis shows GDP, the vertical axis shows other factors that contribute to social welfare, such as health and income inequality. The blue line to the left is the degrowth strategy, the middle line represents an a-growth strategy, and the right line is the current maximum growth strategy. The concave curves show the possibilities of production at times 1 and 2. The convex curves show the social welfare indifference curves at time 1 and 2. Combinations of GDP and other factors that are possible and optimal are found where the two curves cross, like at points A and B. These are the optimal points that the a-growth strategy reaches, because it does not define ex ante limitations, such as minimal or maximum growth. This shows that the economy will, over time, move from A to B by this strategy. In this case it leads to moderate positive growth, but with other shapes and positions of the curves, different results can be reached (Van den Bergh, 2016, pp. 504-505). The graph also shows the growth and degrowth strategies. They never reach the optima A and B because they are limited by a minimum or maximum percentage of growth, which leads to either an overdose of GDP and not enough other factors, or vice versa. All of these combinations of GDP and other social welfare factors are lower on the social welfare curves than the Pareto-efficient points that a-growth reaches. This is interesting, because we have seen at the start of this chapter that the Pareto-efficiency of GDP is often used as an argument to keep using the indicator. However, this graph suggests that real Pareto-efficiency can be found by *not* making GDP central to policy. Moreover, the graph suggests that absolute welfare losses grow over time, because they deviate further from the a-growth strategy.

In a comparison with the Rawlsian principles of intergenerational justice mentioned above, the theory of a-growth creates some problems. As we have seen in Rawls' (1999) two stage pattern of development, once we enter the second, steady-state, phase, we are prohibited from any accumulation. Van den Bergh (2016) clearly

shows in Figure 4, however, that creating the optimal amount of social welfare (which is our chosen metric of justice) is possible *with* accumulation.

Figure 4. A comparison of growth, a-growth and degrowth strategies

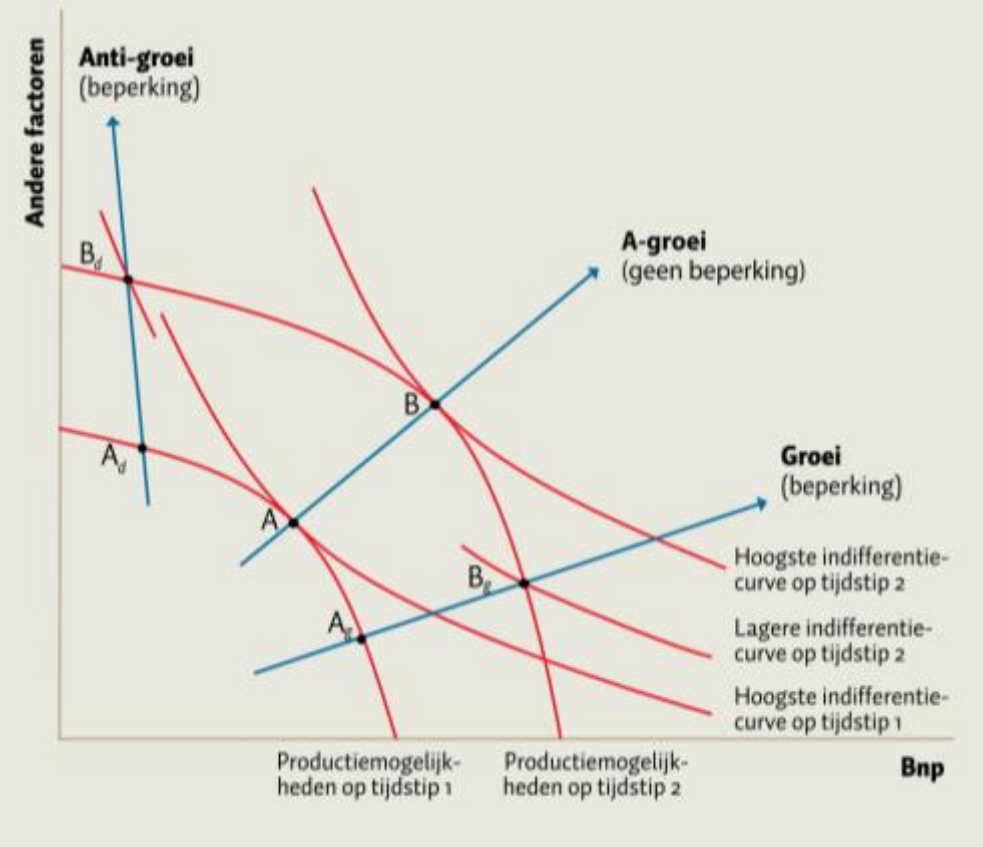

Figure 4. Social welfare implications of an a-growth strategy, compared to growth- and anti-growth strategies. Adapted [reprinted] from "Groene a-groei en de klimaatuitdaging [Green A-growth and the Climate Challenge]," by J. van den Bergh, 2016, *ESB Energie en Milieu, Vol. 101, p*. 504. Copyright 2016 by "ESB Energie en Milieu".

Figure 4 shows that we need a *balance* between economic growth and other welfare factors. Van den Bergh states that in order to create this international level playing field the democratic support for climate change must develop slowly. This requires a society with institutions capable of facilitating this democratic process through transfer of information from society to society, but also within societies. Institutions such as education and public media play an important part in this process. This seems another plea for institutions that can fulfil this role, adding to the Rawlsian argument I made in the last chapter: we need to invest in just institutions in order to combat climate change. A broad understanding of climate change, its effects and what we can do to counteract them successfully is a great undertaking. This transition in thinking needs time to develop and trickle down from the first innovators and entrepreneurs to every corner of society. This is a deeply social process that cannot be

ignored. That is why the technocratic view that De Mooij and Van den Bergh describe runs into difficulties; technology is not the only factor that needs to change. I will elaborate on this point in chapter three.

Another argument for the strategy of a-growth is that good climate policy would fare better in a democratic process than a degrowth strategy. Van den Bergh argues here that policy should never be formulated in a negative way, as degrowth is, because it draws attention to loss of income. Instead, it should be focused on the positive: combating climate change. Not only is the message of combating climate change an effective one, you can simultaneously argue that these climate policies won't only work for the environment but actually lead to growth of social welfare. Democratic support for policies relies often on having *a good story*.

Van den Bergh's point is that we do not know what the effect of serious climate policy will be on economic growth. It might slow down, it might disappear or it might be negative. This, however, should not deter us from enacting these policies. As I have argued in the previous paragraph, social welfare is not dependent on economic growth. A small percentage of growth is good, but we would do better to shape our institutions in such a way that they embody the procedural justice Rawls argues for. Procedural justice, as stated, essentially means that justice will be done, *whatever happens*. This means that institutions and their policies must be devised in such a way that justice will be done in the face of slow, zero or even negative growth. Therefore, I argue that green a-growth is the solution we would come up with in Rawls' original position. By providing the people behind the veil of ignorance with all the information about economic growth, but without the vested interests, a-growth provides a neutral option that efficiently optimises the position of the least well-off.

And, as I have argued in the first chapter: our society has the means to do this, it just needs the *will* to do it, or perhaps feel the *urgency* to do it. Furthermore, the social welfare we seek, as has been argued by Heath and Van den Bergh above, comes from many other directions than just economic growth. In fact, it is most efficient to strive for social welfare with different means.

E. Conclusion

In this chapter I have aimed to find out what strategy of economic growth would best fit the Rawlsian egalitarian principles of intergenerational justice. Rawls himself

was quite clear about his views on abundance and avarice: it is not conducive to a more just state. I have argued, to the same effect, that, while economic growth in itself has definite positive effects, a focus on economic growth is unhealthy from the perspective of social welfare. The use of the GDP indicator fuels this unhealthy strategy by erroneously but tenaciously assuming that a growth in material private consumption will lead to a growth in social welfare. A connection between strategies of economic growth and Rawlsian justice is therefore easily made. Considering the different views that I have discussed in this chapter, economic growth is clearly not the one-dimensional, objectively positive thing that it is claimed to be in mainstream media and politics; it has definite drawbacks and definite benefits. I have argued, for instance, that redistributive policies have more merit in developed nations (where the goal is to create *equal* social welfare), whereas a higher growth rate has merit in developing nations. At the very least, the mainstream attitude to economic growth lacks nuance. I have aimed to shed light on the factors involved in the concept of GDP growth and its use as an economic strategy. I have shown that a focus on economic growth in economic policy comes at great cost to society, both on the front of social welfare as environmental welfare. In light of this discussion it makes sense not to steer for economic growth but to adopt Van den Bergh's a-growth strategy. Focusing our policy on quality instead of quantity will allow for the positive effects of growth to exist, but not at great cost to society. This will allow us to meet the Rawlsian requirement of maximising the position of the least well-off, intergenerationally. By adopting an a-growth strategy, a Pareto-efficient scenario is likely, where growth does not come to the detriment of the worst off and social welfare benefits are maximised across the board. An a-growth strategy, moreover, makes sense from the point of view of Rawls' original position, because it takes an (Pareto-) efficient middle ground. By limiting our economic growth, we limit the physical size of our economy, which will take pressure off the environment. In addition to the savings rate we discussed in chapter one, where a policy of active investments in sustainable technology and education is central to macroeconomic decision-making, the goal of intergenerational justice comes that much closer.

In light of this conclusion, the additional requirement to Rawls' principles of intergenerational justice, as formulated for the challenge of climate change in the conclusion of chapter one, needs an addendum. The additional requirement for intergenerational justice regarding the climate change challenge now reads as follows:

1. We are obligated to maximise the position of the least well-off intergenerationally by (i) adopting a positive savings rate, and (ii) adopting an a-growth strategy.

In the following chapter, I will examine circular economics in the light of these requirements of justice.

III – Circular Economics

In the previous chapters, I have argued for a Rawlsian conception of intergenerational egalitarian justice, supplemented by an additional requirement for intergenerational economic issues of climate change. The first chapter has shown that Rawlsian intergenerational justice is mainly about maximising the position of the least well-off *transgenerationally*. In order to do that, the second chapter discussed views of economic growth strategies. I have argued that the strategy of agnostic growth fulfils the requirements of these Rawlsian principles best.

This chapter discusses the opportunities and challenges in this framework for a circular economy. The circular economy will be defined and examined in the light of Rawls' just savings principle and the theory of green a-growth. I will also discuss the underlying principles of the circular economy and how a circular economy can contribute to social welfare.

As the basic functions of this theory are mostly the same among all interpretations, I will start by providing the broad strokes for a definition of circular economics. Here a broad and narrow definition are given. The two different arguments for these broad and narrow definitions, one from the perspective of profit and one from the perspective of sustainability, will subsequently be discussed. These two perspectives point to reasons why this theory has gained popularity. I will discuss the idealistic tensions that I have identified within this economic theory. I will argue that a broad interpretation of circular economics opens the way for the elements of sustainability and growth strategy that we have discussed, aiding in our pursuit of intergenerational justice.

A. Defining circular economics

Arnold Tukker, chair of Industrial Ecology at Leiden University, writes that, besides implementing a carbon dioxide neutral energy system, implementing a circular economy is nowadays often viewed as a necessary precondition for sustainability (2016, p. 4). The Ellen Macarthur Foundation, an authority in the field of circular economics, defines circular economics in the following way:

> "Looking beyond the current "take, make and dispose" extractive industrial model, the circular economy is restorative and regenerative by design. Relying on system-wide innovation, it aims to redefine products and services to design waste out, while minimising negative impacts. Underpinned by a transition to renewable energy sources, the circular model builds economic, natural and social capital" (Ellen Macarthur Foundation, 2015b)

Circular economics is a blueprint for an economic system focused around a different usage of *natural resources*, such as land (including all minerals and ores), water, vegetation, animal life, atmosphere, etc. The general idea in circular economics is that we model our economic system after the ecosystem that governs these natural resources. Ecosystems are circular; all resources are used by organisms and any waste products provide other organisms with resources. External energy sources such as water, air and the sun, are never ending. The ecosystem is a delicately balanced product of centuries of evolution, where every organism functions by virtue of the ecological network they are a part of. Circular economics aims to mimic these processes by adapting our technological systems to connect to our ecological systems in a more efficient way. Central to this idea is the reuse of waste, through methods such as substituting scarce natural resources to more abundant or better reusable resources, a more efficient use of natural resources through advanced forms of recycling and adapting our patterns of consumption to fit a finite resource base. In other words, a circular economy keeps resources in a cycle, instead of continuously adding new resources to the system, which will inevitably end up as waste (Tukker, 2016, p. 4).

In this sense, it follows ecological economist Daly's (1996) argument that we should view our economic system not as an independent system that can grow indefinitely, but as embedded in and dependent on a finite ecosystem. Circular economics provides the principle of circularity to achieve a better balance between economy and ecology. Tukker (2016) argues much in the same vein, when he states that growing indefinitely can never be the goal of a sustainable economic system. He provides us with a telling example. Imagine that we aim to maintain a growth rate of 7% worldwide. This was a normal rate of growth for western economies around the 70's and still is the growth rate of China, despite its economic crisis. With a growth rate of 7%, the worldwide economy will double in size every ten years and grow ten times

as large over 35 years (in 2052). If you want to keep growing like this, and you don't lower the use of resources, soil and water per euro, you will run into serious problems. In 200 years, the economy will need the entire volume of water on our planet, including sea water. In 300 years, the worldwide economy will need an amount of primary resources equal to the volume of the entire earth's crust. After about 400 years, we will need an amount of oil equal to the volume of our entire planet (Tukker, 2016, p. 5).

This means that with regards to *natural resources,* we need to make the shift from the current paradigm of economic quantitative *growth*, to an economy based on qualitative *development*. As I have discussed in the first chapter, natural resources have a strong connection to the establishment of just institutions. As Rawls argues, a state can start forming just institutions as soon as a sufficient material base is obtained. Apart from resources being a matter of justice, they are also a matter of social welfare. As Raworth (2017) has shown in her 'doughnut' model, social welfare depends on our access to material goods and our sustainable use of them, as social welfare also depends on staying under the ecological ceiling.

Maintaining this sufficient material base is what circular economics sets out to do, by organising the economy in such a way that barely any resources go to waste and a minimal amount of primary resources (including fossil fuels) need to be injected into the system. The quality of products plays an important role in obtaining this goal; products need to last longer and be designed to be taken apart again and reassembled as a new product. The implementation of a circular economy would mean departing from our current linear economic model where profit is made from taking resources from the environment, making products or services and then dumping the waste of these products and services back into the environment; take-make-waste. A circular economy, in contrast, creates closed systems based on resources, where companies are linked together based on who can make something from whose waste. From this idea, it logically follows that fossil fuels do not fit into this system; the waste from the use of these fuels has caused much of our climate change. Green, renewable energy in the forms of wind, water and sun play an important part in circular economics. In the system diagram in Figure 5 this connection of ecosystem to economic system is visualised.

Figure 5. Outline of a Circular Economy

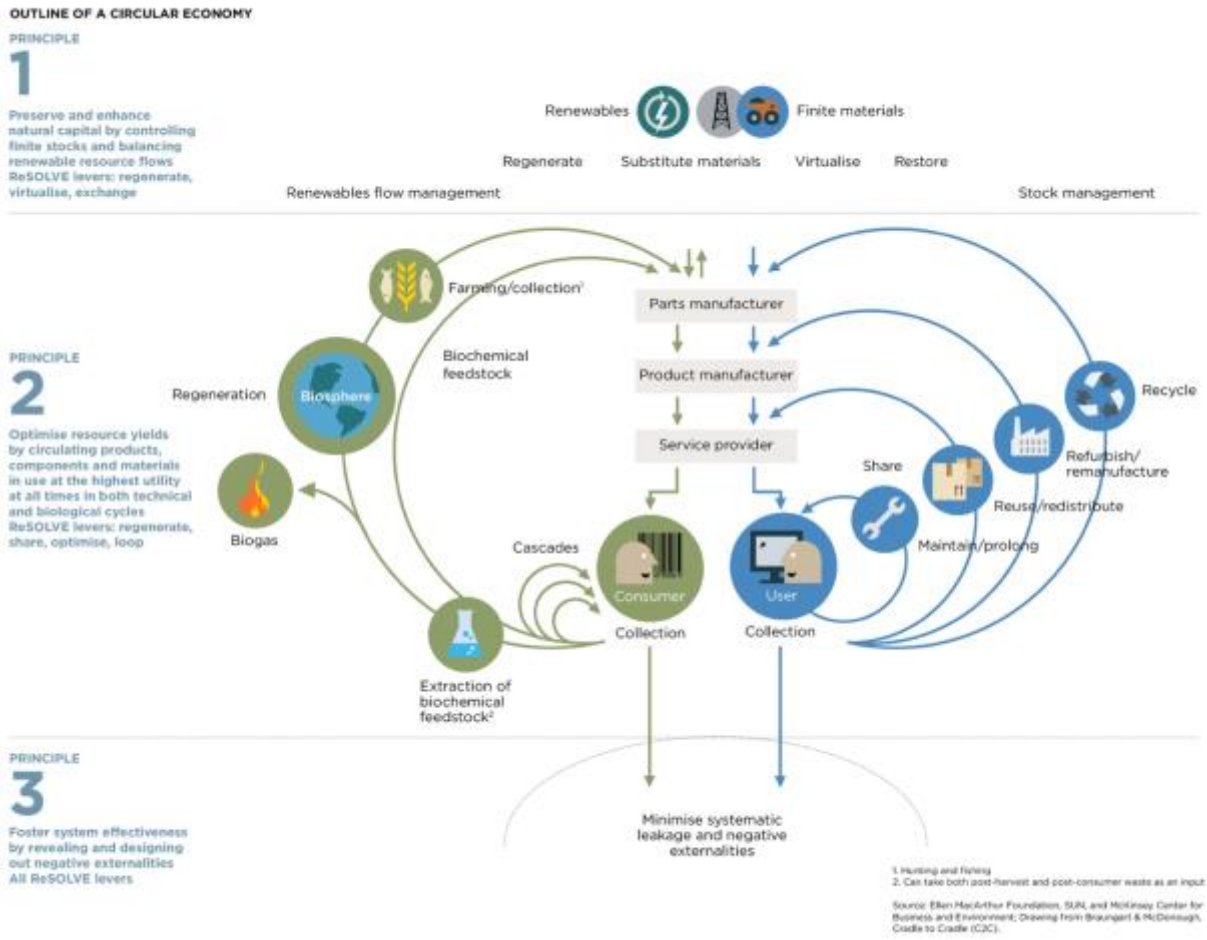

Figure 5. Systems diagram of a circular economy. Adapted [reprinted] from "Growth Within: A Circular Economy Vision for a Competitive Europe", by the Ellen MacArthur Foundation, 2015a, p. 24. Copyright 2015 "Ellen MacArthur Foundation".

1. Narrow circular economics

In defining circular economics, it is useful to distinguish between a narrow and a broad definition. In the narrow definition, the focus lies only on the circular use of resources like I discussed above. This view focuses mainly on the technical innovations needed and the new business models that will make the new networks possible. The assumption is that implementing these new models will bring us sustainability and social welfare, under the name of *natural* and *social capital*, respectively. Therefore, this narrow definition resembles more of a sophisticated system of recycling, which is a limited view of what circular economics could embody. Moreover, writes Tukker,

there are three ways in which a circular economy in this narrow definition will never solve our sustainability problems.

First, he argues that almost half of our resource use is inherently linear. Take fossil fuels for example, which we have to burn to generate energy. The only circular solution to this is banning the use of fossil fuels and transitioning to a green energy system. Another inherently linear system is food, which makes up almost 30% of our resource use. After all, we eat our food, and the waste from that process is difficult to reuse. There are, however, some improvements to be made. For instance, as half of our agricultural land is used for animal food production, by consuming less animal products such as meats, eggs and dairy, we would drastically lower our resource use.

Second, many developing countries are still building new infrastructure every day and will continue to do so for many decades. Hu et al (2010) have concluded that you can only cover your resource needs with what you get back from the economic system (the so-called 'urban mine') if you have reached a 'steady state' in terms of infrastructure. And this steady state, Tukker predicts, will not be reached for fifty years or more in many countries. Moreover, he argues, even in such a steady state, many types of materials will not be directly reusable and will need energy to transform. So even a steady state can never be completely circular.

Third, he argues that a projected growth rate of 7% will remain untenable even with reducing our resource use dramatically through a circular economy. This circular model purports that, with the same use of materials, your economy could still keep growing. This is called a *decoupling* of economic growth and material use. Tukker argues, however, that this decoupling strategy will not get us far. His example of a growth rate of 7% over hundreds of years, mentioned above, clearly shows that this growth rate faces boundaries. As 7% growth means that our economy would grow tenfold over thirty-five years, you would want our material needs to be ten times as small as it is now. This means that in a hundred years, when the economy is a thousand times as large, your material use per euro would need to be a factor thousand smaller than now, with complete decoupling. Put in terms of material use for a car, this would mean that a car now, weighing a thousand kilograms, could only weigh one hundred kilograms in thirty-five years. In one thousand years, the same car could only be built out of one kilogram of resources. This is, of course, quite impossible.

In other words, Tukker concludes, every economy needs its physical base and that base will always need to grow as the economy does. Namely, however you spend

your money, it will inevitably result in the use of new resources somewhere in the chain. Only pumping resources around will not solve our sustainability problems. This does not mean, argues Tukker, that we should not aim to implement a circular economy. Crucial in his argument for a circular economy is its ability to transform money into social welfare more efficiently than the current economic system. In arguing this he takes his definition of circular economics a step further than the narrow definition.

2. Broad circular economics

In the broad definition, circular economics is seen more as a grand-scale social transformation, encompassing a different use of resources and green energy but also impactful *behavioural* changes such as new ways of production, consumption and spatial planning. This view affords a more central role to the ways in which circular economics is able to provide social welfare.

To place this new economic thinking in its context, it is helpful to think in three economic phases: the linear economy, the recycle economy and the circular economy. Many businesses nowadays are still rooted firmly in the linear economy, and a considerable part has ventured into recycling territory. *Broad* circular economics takes these ideas to a new level. It is not just about resource efficiency or substitution anymore, it is about a new way of thinking about how we produce our products, from Research & Development to people's homes, and back into the cycle. It is also a new way of approaching consumption, for instance in a shift from ownership to use. It has great impact on spatial organisation, when closing loops leads to businesses clustering together and windmills change the look of the landscape. Our work and free time will take on a different character, as notions about sustainable consumption and production will need to be imbedded in our decision-making processes. Broad circular economics, therefore, is quite the social transition.

The worry is that circular economics will only be accepted in its narrow form. Our principles of intergenerational justice (which state that we must maximise the position of the least well-off intergenerationally through (i) adopting a positive savings rate by adapting our economy to be sustainable, and (ii) adopting an a-growth strategy) will not be satisfied due to the decoupling strategy which is part and parcel of this narrow definition of circular economics. To give an example of this narrow vision, which is sadly the most popular, the Ellen MacArthur Foundation states the following

in the introduction to their report *Growth Within: A Circular Economy Vision for a Competitive Europe* (2015a):

> "The circular economy is gaining increasing attention in Europe and around the world as a potential way for our society to increase prosperity, while reducing dependence on primary materials and energy. The European Commission is expected to propose a "circular economy package" by the end of 2015, and many business leaders embrace the circular economy *as a path to increasing growth and profitability*." (p. 4, emphasis added)

From the title alone, it becomes clear that economic growth is still very central to the debate. In its broad definition, circular economics has potential to guide us more towards qualitative development and an overhaul of our growth-focused economy. The narrow definition runs the risk of matching *too well* with our current economic paradigm. These two different definitions of circular economics are promoted by two distinct arguments. The broad definition is supported by what I will call the Sustainability Argument. Here a broad perspective on climate change and the necessary moral evaluation of our economic system is embraced. In the narrow definition, the focus is on just a small element of what CE could really be about. The main argument for this interpretation is the Profit Argument.

B. The Profit Argument

As mentioned above, the primary advocate and knowledge centre of circular economy is the Ellen MacArthur Foundation, based in Britain. They have published reports, in cooperation with McKinsey & Company, among others, arguing that our current model's waste doesn't only dupe the environment (the 'plastic soup' in the oceans, the hole in the ozone layer) but also flushes valuable materials (and the profits they may yield) down the proverbial toilet. They have estimated this loss of value in a 2016 report at billions of dollars. This strengthens their argument for mainstream theorists considerably; they have added a profit-element. Viewing circular economics as desirable primarily because of the profits it may yield, I will call the Profit Argument. The Profit Argument appeals to the status-quo in modern economics that I have

explored in chapter two. The fervent belief in the merits of economic growth fit this argument well. In a system such as ours the Profit Argument is a decisive one.

Since the conception of this trend and especially since the economic crisis of 2008 many people have opposed the idea of putting profit first. However, as this is the 'language' modern business speaks, turning to this Profit Argument might increase public support for the plan. In the previous chapter, we have seen that progressive policy about sustainability is difficult in the area of political feasibility. Using profit as a motivator may help get these plans off the ground. After all, investments need to be made to be able to close the resource loops. This research by the Ellen MacArthur Foundation shows business that these investments are worth taking, even lucrative. This makes a very compelling and important argument, especially for the businesses that are going to have to make this change. However, as Martin (2016) has pointed out, the Profit Argument also might corrupt the idea of a circular economy to such an extent that it won't be able to attain the goals of sustainable development it has set itself. There seems to be a real conflict of ideas here, where the system claims to put planet and people first, but advertises the transition as a lucrative business venture, putting the money centre stage again. Martin describes the example of the downfall of the sharing economy, another economic theory based on sustainability, where a strategy of "corporate co-option" lead to the downfall of this system (Martin, 2016).

Ghisellini et al. (2016) show that the goal of circular economics, essentially, is to uncouple economic growth from environmental pressure. As Tukker argued, this common decoupling strategy does not bode well. Antal and Van den Bergh (2013) share this pessimistic view of the decoupling strategy, as shown in Table 3.

Table 3. Barriers to decoupling of environmental pressures from economic output

Concern	Explanation	Example
Rebound	Efforts to solve an environmental problem can have indirect effects that cause the efforts to be ineffective (like energy rebound), or can aggravate other types of environmental problems ('environmental rebound')	Energy rebound: higher energy efficiency can stimulate more indirect energy use Environmental rebound (shifting of problems): reduction of carbon emissions through expansion of bioenergy and nuclear power will (likely) cause biodiversity loss and radioactive waste
Non-linear abatement costs	The cost of emission or material use reduction rapidly increases at higher abatement levels, as one runs out of cheap (cost-effective) options	The cost of greenhouse gas emission reduction grows progressively with more ambitious targets as it is difficult to move away from fossil fuels
Correlation between pollution and growth at the sectoral level	The contribution of highly pollutive sectors to growth is substantial (growth depends on factor productivity increases which may be easier in capital-intensive – often 'dirty' – industries)	Heavy industries and the construction sector are expected to grow rapidly in developing countries and emerging economies in the coming decades, with an inevitable increase in associated environmental pressures
Geographical shift of production and consumption	If the share of highly energy- or material-intensive economies in the world economy grows, global average efficiencies are likely to decrease	Recent energy efficiency improvements in many countries were offset through this channel. For instance, China exports energy-intensive products to western countries
Social–political feasibility of environmental agreements and policies	Strong opposition from vested interest groups can block the establishment of international agreements and national policies	Lobby groups, corrupt administrations and uncooperative countries can resist or weaken proposals Misinformation, e.g., about climate change, can reduce public support for action
Low effectiveness of established policies	Compliance with policies can be low because enforcement is difficult due to bad policy design, imperfect monitoring and control, or corruption	Policies are often not translated into actions or loopholes for polluters remain, especially in developing/emerging economies with weak or corrupt governments

Note. Reprinted [adapted] from "Macroeconomics, Financial Crisis and the Environment: Strategies for a Sustainability Transition," by M. Antal and J. van den Bergh, 2013, *Environmental Innovation and Societal Transitions, Vol. 6,* p. 50. Copyright 2013 by "Elsevier B.V."

In the search for ways to make our economy more environmentally friendly, most policies are centred around conceptions of 'green growth' and 'sustainable growth', they write. The main assumption in this mainstream approach is that there is no conflict between endless productivity and income growth on one hand, and a neutral ecological environmental footprint and full employment on the other. This view corresponds with the *technocratic perspective* that we discussed in chapter II. This perspective distinguishes itself by the belief that through technological advances our economy can continue to grow indefinitely. As a circular economy would change the composition of the economy, for instance by shifting more towards a service economy, value is not only determined through the use of physical resources. However,

as Tukker (2016) has argued, any type of consumption and production will always involve the use of resources.

Resource efficiency and the transition to a service economy should allow the economy to keep growing, by decoupling value from a physical product (De Mooij & Van den Bergh, 2002). This is a problematic assumption, according to Antal and Van den Bergh. They take this position much further than Tukker when they argue, that is highly uncertain that we will be able to reduce our CO2 output by 95% and still maintain even a growth rate of 1,4% (which is relatively low according to mainstream standards). Although decoupling on a large scale has not been tried yet, they have reasons to be sceptical. As shown in Table 3, a decoupling strategy faces problems within national economies and their relationship to the global economy. Fundamentally, resources and productivity growth seem to be inextricably linked. The absence of sustainable substitutions to resources and the unpredictable rebound effects will harm its effectiveness. It also becomes less promising when we take the entire system into consideration, where most of the pollution is produced in quickly developing countries that provide western countries with products and services. Moreover, it is a difficult political strategy, as low political feasibility will make it difficult to reach consensus and policy compliance and enforcement will pose problems. The main trouble is, they agree with Tukker (2016), that economic growth always means a rise in resource throughput, which puts a large strain on the environment. In other words, putting our money on decoupling is risky business. What we must do, according to Antal and Van den Bergh, is find strategies that will reduce our dependency on growth for economic stability.

Ghisellini et al. (2016) argue, therefore, that circular economics is not an appropriate tool for growth-oriented economies, but instead would do better in a steady-state scenario. Once we have all the resource loops in place, we are at some point bound to be faced with the reality that we cannot grow anymore. That realisation is exactly what is missing from the debate now. The growth-effects of circular economics that the Ellen MacArthur Foundation talks about are realised mainly at the start of the transition. That is why their definition of circular economics is not only narrow, but also mainly focused on short term effects. Even though the transition will take decades, there will come a time where growth will have to slow considerably (Ghisellini et al, 2016). This is why the system needs to be adept at dealing with the repercussions of this realisation. The system needs to be based on a sound, long-term

strategy that can create social welfare even when growth is small. In other words, it needs to be sustainable.

The largest pitfall of this profit-driven choice for a circular economy is its inability to see the large systemic changes that will be necessary to make it truly sustainable. Central to circular economics is the notion that you design a product to be circular from its inception, which means that you design the ways to reuse and recycle them *from the start*. This requires a shift in thinking for designers, who need to find new sustainable options for existing products, that cannot require too much (more) energy. If a product is not designed in this way, we will run into problems as soon as it is used up and put back into the cycle again. The most cost-effective way of implementing a circular economy is to do it rigorously. This shift in thinking needs to be supported by changes in the education of designers.

C. The Sustainability Argument

Circular economics could be so much more than just a new way of making money. If we look beyond the basic regenerative features of this economic system we can discover possibilities for a system that can bring us closer to the goal of intergenerational justice. The broad definition of circular economics is supported by what I have called the Sustainability Argument. This argument, in short, holds that circular economics should be pursued because it has the potential of creating a sustainable society, which by definition implies long-term strategies. Here, sustainability is not only understood in terms of a sustainable use of resources, but also in terms of social sustainability, where economics and society reflect sustainable values. The Sustainability Argument takes the position that an economic model has merit when all economic things, like profit, growth and consumption, always have the goal of being sustainable. There are five elements of circular economics that I want to highlight here to show its potential, where I will draw from the work of Schreuder Hes (2016) for the first three.

Elsewhere, I have argued that our first indication of this potential is the fact that circular economics has been designed specifically as an answer to the problem of climate change (2016, p. 48). This diverges much from our linear system, whose roots lie in the advancement of profit and production. Circular economics explicitly sets itself

the goal of creating a harmony between societal development and nature. The value system of a circular economy therefore differs from our current economic model.

Second, through creating chains of businesses where resources flow in cycles, the production and reuse of products becomes the responsibility of multiple businesses in such a chain. This shifts emphasis from competition to cooperation, focusing more on communal gain than on individual gain. More interdependency could create networks of businesses that create more social welfare for each other through the forging of meaningful relationships. This also extends outside product chains. Businesses are explicitly expected to incorporate corporate social responsibility into their business models, creating a more durable relationship with the outside world. This stands in stark contrast to many businesses now, who do not pay heed to the external effects their production processes have, on society or the environment. Defining society and the environment as important stakeholders is an important shift in thinking that will benefit our society more than any economic growth spurt as a result of implementing this circularity will do.

A third important element of circular economics is its proposed shift towards a system of *using* products instead of *owning* them. Like Philips is already selling light instead of lightbulbs, circular businesses could provide products to customers as part of a leasing agreement, with a service contract included. Barring the legal steps that need to be taken to make this a valid option, the idea of an economy where possessions are less important could potentially strengthen a feeling of community, writes the Guardian (2014). The worth of ownership changes into the worth of a meaningful bond to the products that you use. In chapter two we have discussed the problem of relative consumption, where we saw that the intrinsic properties of goods have less impact on social welfare than the social properties of these goods (such as the status you attain from owning them). A circular economy could potentially shift focus more to intrinsic properties. In changing the social structure of ownership, something could also change in the zero-sum structure that arises through consumption, where consumption essentially creates negative externalities. A circular society could have less competitive and defensive consumption.

Fourth, Daly's (1996) argument for qualitative development instead of quantitative growth is relevant here. In a circular economy, the goal is to keep resources in the cycle of production for as long as possible. This means that product design will use materials that, when the product is used up, are still of such quality that

they can be incorporated easily into another product. Additionally, the quality of products in themselves will need to be higher, to ensure a longer life. The development of such products, with an emphasis on quality more than quantity (where products have a short life in order for companies to sell as many products as possible), fit with Daly's argument.

Fifth and last, as I have argued above I have assumed for the purposes of this thesis the welfarist position on metrics, valuing resources based on their ability to provide social welfare. From Tukker's (2016) analysis it has become clear that natural resources are necessary to arrive at a steady state scenario where a circular system can actually take effect. In order for developing nations to arrive at such a stage, where there is enough infrastructure in place to provide the social foundation such as Raworth (2017) describes, they will need primary resources. Elements of this foundation, such as work, health and education, all need infrastructure and therefore resources. This makes the efficient use of resources, through reusing them at the greatest quality possible, not only a matter of higher profits, but a matter of justice. Tukker subsequently argues that the fact that we will need primary resources for years to come, should not deter us from transitioning to a circular economy. As the saying goes: 'every little bit helps', and circular economics stands to help more than a little bit. By investing in this transition, or in other words, adopting a positive savings rate, we are aiding the cause of intergenerational justice. The drop in demand for primary resources will alleviate pressure from the environment, leaving the earth a in a good condition for future generations, with more usable resources and a more just economic institution.

This shift in economic thinking that has been happening could really gain momentum if we hold on to the principles that circular economics, as a *means* towards sustainability, is based on. Connecting this transition to other transitions and social challenges such as green energy and soil quality is vital to ensure the speed of the entire process. Secure design of circular products asks for realistic demands of our renewable energy sources and an awareness of the entire international production chain. Circular economics demands that we ask questions about the effective use of our resources, possibly over considerations of profit. For instance, we should critically assess questions such as if the best use of our barley (and of the water, soil and minerals we use to grow it) is to brew beer from it and export it all around the world. It is a search for win-win situations between private businesses and these social challenges. A

transition such as this stands or falls with public support. Not only does it ask a lot of businesses, but it also demands a change in behaviour from citizens. There are questions of equity at play there, as public support will soon be lost if citizens notice that business get to keep doing their business as usual, but households are expected to make large changes. Much of this public support depends on the perception of this transition and what it can bring our society. In order to make this transition impact social welfare in a positive way, such that public support will remain strong, perception is an important element. To sum up, all of these elements play into each other and fulfil an important role in a circular economy. None of these elements can be forgotten, if a circular economy is to be truly sustainable. In that form, it has the potential of creating a stable economy, also in terms of climate neutrality, that can give us the room to deal with issues of redistribution. Climate change, in this way, could be the catalyst we need to reform our economies to be more just.

D. Conclusion

In this chapter I have looked at the circular economy as a possible avenue for providing intergenerational justice with regards to the problem of climate change. In conclusion, I argue that a circular economy has great potential because of the gains in environmental sustainability due to its efficient use of resources and social sustainability due to its focus on community and common responsibility. Its downfall, however, could lie in trying to sell this idea in mainstream-terms and only focusing on its ability to provide growth.

In chapter one and two, we concluded by formulating an additional requirement to Rawls' principles of (intergenerational) justice, specifically meant to tackle the challenges climate change faces us with. The following requirement was devised:

1. We are obligated to maximise the position of the least well-off intergenerationally by (i) adopting a positive savings rate, and (ii) adopting an a-growth strategy.

I have argued for a broad definition of circular economics, because it has the potential, unlike the narrow definition, to advance this requirement and Rawls' own principles of justice.

Conclusion

In this thesis, I have attempted to define some moral duties, pertaining to our economy, that we as a democratic, liberal society, now and in the future, have towards our generation and future generations, regarding the anthropogenic climate change challenge. I have focused my analysis on philosophical and economic sources, concentrating on the impact of climate change on theories of intergenerational justice and on strategies of economic growth.

Our economic activities have been shown to have great effect on the life sustaining systems of our earth. The prevention of rising above this critical ecological ceiling is an important social goal. Simultaneously, a focus on providing all people with a social foundation should be a central endeavour. These goals are inextricably linked; a breach of the ecological ceiling, through human activity, has detrimental effects on the social foundation. In my analysis of these issues in the areas of philosophy and economics I have arrived at the following requirement, which serves as an addendum to Rawls' principles of justice and his just savings principle. In order to aid the pursuit of intergenerational justice, in particular in the face of anthropogenic climate change, we should:

1. adopt a positive savings rate, so as to explicitly define the obligation to focus our policies on providing for the least well-off transgenerationally;
2. adopt a policy of agnostic growth, where we focus on good climate policy instead of steering for growth, allowing for a Pareto-efficient balance between growth and social welfare from the economic production processes, and
3. embed these policies in circular economy, where resources are protected and a sustainable social environment is nurtured.

As I have discussed in chapter one, a Rawlsian egalitarian conception of intergenerational justice focuses mainly on maintaining just institutions (defined by the enjoyment of basic liberties and fair equality of opportunity) and on maximising the position of the least well-off *across generations*. The just savings principle is the guide in this endeavour. I have argued that while we are in a steady state phase according to Rawlsian definitions, the impact that climate change has on our society warrants a positive savings rate. The reason I argue a positive savings rate instead of

the zero-savings policy Gosseries argued for, is that a positive savings rate would make sure that the results of our social productivity will be used for the specific purpose of pursuing intergenerational justice through effectively combating climate change. By investing those savings in social institutions such as education, healthcare and the transition to a truly sustainable economy, we can hope to prevent the worst of the climate change effects for future generations. The rules for this new sustainable economy should be decided from behind the veil of ignorance, which according to my arguments, would involve an agnostic growth strategy. Circular economics provides a focus for these investments, providing a blueprint for exactly the type of technologies and business models that would bring us to an economy that makes much more efficient use of its resources.

As I have argued in the second chapter, the current economic model is too focused on short term gains and has developed many perverse incentives that seem to be leading us away from a more just society. I have shown that the current economic system, being a dominant social institution and therefore a great influence on social welfare, has many steps to take in becoming more just. I do not argue against economic growth or against the benefits it may yield. What I argue against is the striving for *maximizing* economic growth. Much of our discussion has been focused on the ability of the economy to generate equal social welfare. By rejecting the GDP as an indicator and instead adopting an a-growth economic strategy, a Pareto-efficient situation will be reached where social welfare will be created, across generations, both through GDP growth while still allowing room for other policies, such as environmental policies, focused on creating social welfare through other means than the private market. These climate policies could be valuable piece of the bigger puzzle of intergenerational justice. Not only will the current generation benefit from a new economic strategy, but it will enable us to temper some of the causes of climate change (such as the growth of resource-heavy industry), benefiting generations to come.

Circular economics has shown itself to have potential in filling in more of the blanks of what a just economic system, resilient in the face of climate change, would entail. Making more efficient use of our resources certainly is a step in the right direction. What we have learned is that the current discourse on circular economics still supports a focus on economic growth. While technically sustainable, circular economics runs the risk of not being socially sustainable if the people driving the system still hold flawed beliefs about what an economy should be about. This means

that when perverse incentives like huge profits drive people towards a circular economy it could result in a non-pure system that eventually collapses again and will in the end not be sustainable for the environment either. So, while economic growth may be a compelling argument to get the transition off the ground, and will hold truth at least in the short term, in the end it is simply not sustainable. The focus in any of these endeavours should be on designing a new economy where circular business models play an important part, and requirements about ecological and social impact have as much sway as financial robustness.

Like establishing intergenerationally just institutions takes more than adapting our economy to the challenges of climate change, establishing a completely sustainable economy takes more than adopting a circular economic model. As Tukker (2016) argued, we should definitely make our economy as circular as possible, but we should not expect it to solve all our problems, be they the problem of sustainability or intergenerational justice. I have specifically focused on the effects of climate change and how to negate them, but intergenerational justice is also threatened by other factors, which I have not discussed. Therefore, I can say that circular economics is a promising avenue for intergenerational justice with regards to these problems, but it is not exhaustive. Granted, because of the hypothetical nature of a circular economy, it is difficult to say if the positive potential I have mentioned will actually come to fruition. However, given the premise of the circular economy from the start and the enthusiasm by which businesses and governments are embracing this system, both from the argument of profit and sustainability, gives me enough reason to be optimistic. The social transition will be a difficult one, but the potential I have discussed here proves to me that the effort would be worthwhile.

That is why I understand the sceptical remarks from Michael Crichton, by which I introduced my aim in this thesis, as a challenge. If we can muster up the humility to try and bring our economy in balance with the ecology we depend upon, we may have a chance at connecting to the “slow and powerful rhythms of the earth” and create an economy that may be slower than the current one, but will prove to be more powerful.

For profit or loss, for the preservation of human society and the earth:
per aspera ad astra

Reference list

Antal, M., & Bergh, van den, J. C. J. M. (2013). Macroeconomics, financial crisis and the environment: Strategies for a sustainability transition. In *Environmental Innovation and Societal Transitions* (Vol. 6, pp. 47–66). Elsevier B.V. https://doi.org/10.1016/j.eist.2013.01.002

Baard, P., & Björnberg, K. E. (2015). Cautious Utopias: Environmental Goal-setting with Long Time Frames. *Ethics, Policy & Environment*, *18*(2), 187–201. https://doi.org/10.1080/21550085.2015.1070487

Bergh, van den, J. C. J. M. (2011). Environment versus growth - A criticism of degrowth and a plea for "a-growth." *Ecological Economics*, *70*(5), 881–890.

Bergh, van den, J. C. J. M. (2016). Groene a-groei en de klimaatuitdaging. *ESB Energie & Milieu*, *101*, 502–505.

Bergh , van den, J. C. J. M. (2009). The GDP Paradox. *Journal of Economic Psychology*, *30*(2), 117–135. https://doi.org/10.1016/j.joep.2008.12.001

Brundtland, G. H. (1987). *Our Common Future: Report of the World Commission on Environment and Development. United Nations Commission*. https://doi.org/10.1080/07488008808408783

Caney, S. (2010). Climate Change, Human Rights, and Moral Thresholds. In S. M. Gardiner, S. Caney, D. Jamieson, & H. Shue (Eds.), *Climate Ethics: Essential Readings* (pp. 163–177). Oxford: Oxford University Press.

Crichton, M. (1990). *Jurassic Park*. New York: Random House USA Inc.

Daly, H. E. (1991). *Steady-State Economics* (2nd ed.). Washington D.C.: Island Press.

Daly, H. E. (1996). *Beyond Growth* (1st ed.). Boston: Beacon Press.

Daly, H. E., & Farley, J. (2010). Ecological economics: principles and applications. *Ecological Economics*.

Early, K. (2014, March 12). Access Over Ownership is the Future of Consumption. *The Guardian*. Retrieved from https://www.theguardian.com/sustainable-business/access-over-ownership-future-consumption

Easterlin, R. A. (1996). *Growth Triumphant: The Twenty-first Century in Historical Perspective*. Ann-Arbor, MI: University of Michigan Press.

Ellen MacArthur Foundation. (2015a). *Growth Within: A Circular Economy Vision for a Competitive Europe*.

Ellen MacArthur Foundation. (2015b). What is a Circular Economy? Retrieved June

10, 2017, from https://www.ellenmacarthurfoundation.org/circular-economy

Freeman, S. (2016). Original Position. In *Stanford Encyclopedia of Philosophy*. Stanford University. Retrieved from https://plato.stanford.edu/entries/original-position/

Gardiner, S. M., Caney, S., Jamieson, D., & Shue, H. (Eds.). (2010). *Climate Ethics: Essential Readings*. Oxford: Oxford University Press.

Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A Review on Circular Economy: The Expected Transition to a Balanced Interplay of Environmental and Economic Systems. *Journal of Cleaner Production*, *114*, 11–32. https://doi.org/10.1016/j.jclepro.2015.09.007

Gosseries, A. (2001). What Do We Owe the Next Generation(s)? *Loyola of Los Angeles Law Review*, *35*, 293–354.

Gosseries, A. (2008). Theories of Intergenerational Justice: a Synopsis. *Surveys and Perspectives Integrating Environment and Society*, *1*(September), 39–49. https://doi.org/10.5194/sapiens-1-39-2008

Haab, T. C., & Whitehead, J. C. (2017). What do Environmental and Resource Economists Think? Results from a Survey of AERE Members. *Review of Environmental Economics and Policy*, *11*(1), 43–58. https://doi.org/10.1093/reep/rew019

Heath, J. (2002). Should Productivity Growth Be a Social Priority ? *The Review of Economic Performance and Social Progress*, 225–242.

Hoberg, N., & Baumgärtner, S. (2016). Irreversibility and Uncertainty Cause an Intergenerational Equity-Efficiency Trade-off. *Ecological Economics*, *131*, 75–86. https://doi.org/10.1016/j.ecolecon.2016.08.015

Hu, M., Pauliuk, S., Wang, T., Huppes, G., van der Voet, E., & Müller, D. B. (2010). Iron and Steel in Chinese Residential Buildings: a dynamic analysis. *Resources Conservatino and Recycling*, *54*(9), 591–600.

Intergovernmental Panel on Climate Change (IPCC). (2014). *Climate Change 2014: Impacts, Adaptation, and Vulnerability*. Retrieved from http://www.ipcc.ch/report/ar5/wg2/

Kallis, G. (2011). In Defence of Degrowth. *Ecological Economics*, *70*(5), 873–880.

Martin, C. J. (2016). The Sharing Economy: A Pathway to Sustainability or a Nightmarish Form of Neoliberal Capitalism? *Ecological Economics*, *121*, 149–159. https://doi.org/10.1016/j.ecolecon.2015.11.027

Mooij, de, R. A., & Bergh, van den, J. C. J. M. (2002). Growth and the Environment in Europe: A Guide to the Debate. *Empirica*, *29*(2), 79–91. https://doi.org/10.1023/A:1015642326265

Pettinger, T. (2015). Environmental Kuznets curve. Retrieved March 3, 2017, from http://www.economicshelp.org/blog/14337/environment/environmental-kuznets-curve/

Rawls, J. (1999). *Theory of Justice*. Cambridge: Harvard University Press.

Raworth, K. (2017). *Doughnut Economics: 7 Ways to Think Like a 21st Century Economist*. Vermont: Chelsea Green Publishing Co.

Schreuder Hes, M. (2016). Circulaire economie: rechten en plichten [Circular Economics: rights and duties]. In M. Ritter, de & B. Bet (Eds.), *Circulaire Economie. Wat? Waarom? Hoe? [Circular Economics. What? Why? How?]* (pp. 32–52). Den Haag: Stichting Maatschappij en Onderneming.

Sedlacek, T. (2011). *Economics of Good and Evil. The Quest for Economic Meaning from Gilgamesh to Wall Street*. Oxford: Oxford University Press.

Stern, D. I. (2003). International Society for Ecological Economics Internet Encyclopaedia of Ecological Economics The Environmental Kuznets Curve. Retrieved from http://isecoeco.org/pdf/stern.pdf

The Economist. (2015). The Economist explains: Ecological economics. Retrieved April 22, 2017, from http://www.economist.com/blogs/economist-explains/2015/12/economist-explains-9

Tukker, A. (2016). In kringetjes vooruit. De circulaire economie als recept voor duurzaamheid [Advancing in circles. The circular economy as recipe for sustainability]. Leiden: Centre for Sustainability. Retrieved from http://www.centre-for-sustainability.nl/uploads/cfs/attachments/Oratie Tukker.pdf

Wenar, L. (2017). John Rawls. In *The Stanford Encyclopedia of Philosophy*. Stanford University. Retrieved from https://plato.stanford.edu/entries/rawls/#IntTolHumRig