Ethics and Carbon Pricing

An analysis of the ethical justifiability of carbon taxes and emission trading systems

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List of abbreviations

ETS: Emissions Trading System

GHG: Greenhouse Gasses

EU ETS: European Union Emissions Trading System

I. Introduction

More than a hundred years ago, an article in a New Zealand newspaper suggested that the emission of carbon dioxide into the atmosphere may change the climate in a few hundred years[1]. Since then, the population of the world has become more than four times larger[2], and the energy-equivalent of fossil fuel consumption has increased by over 15 times[3]. Projections for rising temperatures range between 1 and 4 degrees Celsius by the end of the century[4], potentially displacing more than 140 million people in the coming decades[5]. The time window for limiting the effects of climate change is growing smaller[6], and it is up to the wealthy and the powerful to finally enact structural solutions.

However, the response of the world's governments has been limited so far, and the response of corporations even more so. Despite the overwhelming consensus within the community of climate

1. Kimberly Hickok. "News Clip Linked Coal to Climate Change — 106 Years Ago Today". Livescience, August 14, 2018, https://www.livescience.com/63334-coal-affecting-climate-century-ago.html

2. Max Roser, Hannah Ritchie, and Esteban Ortiz-Ospina. "World Population Growth". Our World in Data, May, 2019, https://ourworldindata.org/world-population-growth#citation

3. Hannah Ritchie, and Max Roser. "Fossil Fuels". Our World in Data, October 2, 2017, https://ourworldindata.org/fossil-fuels

4. Matthew Collins et al. "Long-term Climate Change: Projections, Commitments and Irreversibility" in *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2013. Pp. 1029-1136.

5. Laignee Barron. "143 Million People Could Soon Be Displaced Because of Climate Change, World Bank Says". Time, March 20, 2018, https://time.com/5206716/world-bank-climate-change-internal-migration/

6. Wageningen University and Research Centre. "Time window for action to limit climate change is closing rapidly." ScienceDaily, September 1, 2016, www.sciencedaily.com/releases/2016/09/160901125440.htm

scientists that climate change is man-made[7], there has been a distinct lack of political will to take drastic measures against it; and for those that do want to do something about it, there is much debate on how it should be done.

There is no surprise as to why there would be such vigorous debate on this topic; there are many ways of dealing with these issues, all with strengths and weaknesses. Economists unsurprisingly tend to favour market based solutions over Command-and-Control[8] (CaC). CaC employs a form of central planning agency to regulate the demand and supply of, in this case, goods that cause pollution[9]. Market based solutions, on the other hand, instead try to put a price on carbon emissions, and then allow market forces to find a new equilibrium on their own.

There are two classic approaches to market based policies in environmental economics[10] ; carbon taxes, and Emission Trading Systems (ETS). These policies owe their intellectual heritage to Arthur Pigou[11] and Robert Coase[12] , respectively. In essence, Pigouvian taxes attempt to set the price, while Coasian permits attempt to set the quantity[13]. Though these writers probably never

7. National Aeronautics and Space Administration. “Scientific Consensus: Earth's Climate is Warming”. Global Climate Change, January 21, 2020. https://climate.nasa.gov/

8. Holladay, J. Scott, Jonathan Horne, and Jason A. Schwartz. *Economists and Climate Change: Consensus and Open Questions*. (New York, NY: Institute *for* Policiy Integrity: New York University School of Law) . pp. 1-43.

9. OECD. “COMMAND-AND-CONTROL POLICY”. OECD. November 2, 2001. https://stats.oecd.org/glossary/detail.asp?ID=383#:~:text=Command%E2%80%94and%E2%80%94control%20policy%20refers,economic%20instruments%20of%20cost%20internalisation

10. Dieter Helm, “Economic Instruments and Environmental Policy”, *The Economic and Social Review* 36, no. 3 (2005): 208-212.

11. Arthur Cecil Pigou, *The Economics of Welfare*, ed. Nahid Aslanbeigui (New York: Routledge, 2017).

12. Ronald Coase, “The Problem of Social Costs”, *The Journal of Law & Economics* 56, no. 4 (2013): 837–877.

13. William J. Baumol, and Wallace E. Oates. *The Theory of Environmental Policy* (Cambridge: Cambridge University Press, 1989), 57.

foresaw their work being used for the issue of climate change specifically, their work now stands to be used for an issue that may prove to be the most difficult challenge humanity has ever faced.

Even when discussing issues as important as climate change to the future of humanity, economists tend not to take ethics into account. Cost-efficiency is often considered to be the most important, and for some, the only factor that should decide which policy gets enacted; but very little attention has been paid to their ethical justifiability. Ethical justifiability is, however, an inseparable factor of the public willingness to desire such a system. We do not just care about outcomes; we want things to be done the right way as well. Discarding these sentiments may very well undermine the popular mandate that decisions in democratic societies are claimed to be based upon.

It is because of this consideration that this thesis will analyse the ethical justifiability of carbon taxes and emission trading systems through the work of three philosophers of economics and politics; Debra Satz, Michael J. Sandel, and Robert Nozick. Debra Satz' framework of 'noxious markets'[14] will analyse the nature of market forces present in the policy of the ETS. Michael Sandel's concept of the corruptive power of commodifcication[15] will be used to analyse the effect of carbon pricing on our perception of carbon emissions. Finally, Robert Nozick's 'Principles of Justice'[16] will be used to construct a system of emission permits in accordance with the Minimal State.

This essay will first give an explanation of the way that the economists Arthur Cecil Pigou and Ronald Coase have sought to deal with externalities. I will then give an explanation of climate change, and the role that economically based solutions might play to solve it. Two carbon pricing mechanisms will be outlined: carbon taxes and emission trading systems, which relate to Pigou and Coase, respectively. Then, these policies will be analysed through the perspectives and frameworks

14. Debra Satz, *Why Some Things Should Not Be for Sale: The Moral Limits of Markets* (New York, NY: Oxford University Press, 2012), 91-112

15. Michael J. Sandel, "What Money Can't Buy: The Moral Limits of Markets" (Lecture presented at Brasenose College, Oxford University, Oxford, May 1998), 94.

16. Robert Nozick, *Anarchy, State, and Utopia*, (New York, NY: Basic Books, 2013): 150-153.

of Debra Satz, Michael Sandel, and Robert Nozick. Ultimately, the aim will be to answer the following question: “Which of the two policy proposals, those of carbon taxes and emission permits, is a more ethically permissible solution to the problem of climate change?”

I will argue that both policies have valid ethical reasons for their implementation; Carbon Taxes avoid many ethical problems that concern the market, including the effect that commodification has on our perception of pollution. Emission Trading Systems show a greater respect for personal autonomy, and may theoretically be agreed on through voluntary cooperation. I will conclude by arguing that there is no clearly ethically superior policy in the case of the choice between carbon taxes and Emission Trading Systems. As such, despite earlier concerns, it may be best for us to base our decision on the basis of efficiency.

II. Literature review

These days, there is a lot written in the science of economics on the topic of externalities. This phenomena forms a core subject of debate for many disciplines, such as welfare economics. The debate on this topic was not always so prevalent, however, and much can be traced back to the thinking of two economic philosophers: Arthur Cecil Pigou, and Ronald Coase. Though I will not be able to do justice to the intricate mathematical thinking behind their theories in this section, as well as to the theories that built upon them, I will provide the basics necessary to understand them in general. I will also clarify them in such a way as that it makes the link between these theories and the policies based on them obvious, once those are explained in the topic on climate change.

Pigou

Arthur Cecil Pigou was a British economist[1] most famous for his work in welfare economics, with his seminal work being "The Economics of Welfare"[2] which was first published in 1920. He accredited with being the first the make a comprehensive account of the phenomenon of externalities, which he identified as being a divergence between social costs/benefits and private costs/benefits. He also developed a theoretical solution, which later become known as "Pigouvian taxes" or "Pigouvian subsidies"[3].

1. The Editors of Encyclopaedia Britannica. "Arthur Cecil Pigou". Britannica, March 2, 2020, https://www.britannica.com/biography/Arthur-Cecil-Pigou

2. Arthur Cecil Pigou, *The Economics of Welfare*, 1-851.

3. Harvey S. Rosen, Ted Gayer, and Abdülkadir Civan, *Public Finance* (Maidenhead, UK: McGraw-Hill Education, 2014), 84-86.

The idea behind these taxes is to cause the convergence of social costs and private costs, as well as the convergence of social benefits and private benefits. This would solve the issue of either oversupply (negative externality), or undersupply (positive externality) of a certain good. Theoretically speaking, the tax should equal the marginal damages of the efficient equilibrium[4].

Consider Pigou's example of train tracks close to other people's property[5]. Sparks generated by the trains crossing the tracks can start fires on this property, thereby damaging it and causing an increase in social costs. Social does not mean that the cost has to be to the public, but simply that these costs are incurred by people who are neither the producer or the consumer.

The train and railway owner(s) are not always liable for such damages, and therefor do not internalize these costs in the private costs, causing a divergence. The result will be an oversupply in the amount of trains running the tracks, and more fires than is "efficient". By taxing the owners to compensate for the damages, their costs rise, which makes them use their railways less. The money may then be used to compensate damaged parties, or be used for the social good in general. Thus private costs and social costs converge, with the most efficient point being where they are equal to one another.

The income from the taxes can also be used to compensate for the damages, for investing in ways to prevent fires, to lower taxes, or simply raise revenue for the government. This last way is something that people typically take issue with, and so some proponents of such taxes advocate for a fiscally neutral approach[6]. This approach shuns the use of such taxes in favour of using them to lower taxes and to subsidize further transition away from harmful externalities.

This causes what is known as the 'double dividend' effect, where the lowering of the externality in question is first facilitated by the direct effect of the taxes, which raise costs, and

4. Harvey S. Rosen, Ted Gayer, and Abdülkadir Civan, *Public Finance*, 84.
5. Arthur Cecil Pigou, *The Economics of Welfare*, 134.
6. Pearce, D. (1991). The Role of Carbon Taxes in Adjusting to Global Warming. *The Economic Journal*, *101*, 938–948.

indirectly by the use of these funds, which increases economic efficiency and promotes less harmful production methods. Some articles have argued against the significance[7] or even the existence of the double dividend effect, due to the effect not being enough to offset economic damages. This is a topic that I will touch on in during in the chapter Four (IV).

Coase

Ronald Coase was a British economist[8] and Noble Prize Laureate most famous for the theorem that carries his name; Coase Theorem. In 1960, Coase published an article titled "The Problem of Social Cost"[9]. In this article he offered an alternative way of dealing with externalities, or 'Social Costs' as he called them. To paraphrase, he argues that in the case of externalities it is not so much evidence for the market having gone too far, but instead evidence of the market not going far enough. If property rights were assigned to the parties involved, it would lead to socially optimal equilibria without the intervention of the state. Though the theoretical outcome of this model, under the assumption of perfect information, is the same as that of the earlier introduced Pigouvian tax[10], it can be argued that this method of dealing with externalities better ensures the autonomy of the individuals and companies involved, and is therefore more optimal.

An example by Jacobs (as cited in Woods, 2010, p.85) that illustrates this well is that of the chemical plant on the river. In the course of producing goods, the chemical plant produces a certain amount of chemical waste that needs to be disposed of. Assuming a world that lacks any kind of regulation on how this must happen, the plant decides that the cheapest way to get rid of it would be to simply dump it all in the river. This to the great displeasure of a group of fisher workers down

7. Parry, Ian W.H., and Wallace E. Oates. "Policy analysis in the presence of distorting taxes". *The Journal of Policy Analysis and Management* 19, no. 4 (2000): 603-613.

8. The Editors of Encyclopaedia Britannica. (2019, December 25), Ronald Coase, Britannica, December 25, 2019. https://www.britannica.com/biography/Ronald-Coase

9. Ronald Coase, "Social Costs", 837–877.

10. William J. Baumol, and Wallace E. Oates. *The Theory of Environmental Policy* (Cambridge: Cambridge University Press, 1989), 57

the stream, as the chemicals in the water cause fish to die, lowering their catch, and subsequently also their profit. Coase claims that the issue can be resolved by assigning the property rights of the river to either one of the parties. If the chemical plant receives the property rights, the fishers may pay it to scale back its dumping of waste, up until the point that the marginal private profit of the company is equal to the marginal damage inflicted on the fishers[11]. If the fishers are assigned said rights, the chemical plant may pay the fishers to be allowed to dump a certain amount of waste in the river, up until the same point as earlier. Theoretically, it does not matter which one of the parties, as in both cases the same quantity of pollution is agreed upon, and in both cases total welfare is maximized.

11. Harvey S. Rosen, Ted Gayer, and Abdülkadir Civan, *Public Finance*, 81.

III. Climate Change

Over the course of millennia, humans have shaped the physical world around them to suit their needs. Forests were chopped down do gain farmland, rivers redirected for irrigation, and canals built to facilitate transportation, amongst many others. All of humanities' previous projects had one thing in common, however, and that is that they were local in nature. Both the benefits of the projects' success, as well as the costs of their failure, have been for locals to bear. It is perhaps then no surprise that we have been slow to act; We are simply not accustomed to affecting the climate on a global scale, and certainly not to being affected by it in this way. It seems then that both societies alone, as well as societies together, have entered a new paradigm; and a new paradigm asks for a new way a thinking, of living, and of creating. It is to these aspects that the economy is closely related.

In addition, corporations have proven to be very uncooperative when it comes to dealing with climate change. Exxon-Mobile, to give one such an example, already knew about the potential harm of greenhouse gasses to our climate through climate change in 1977[1]. They proceeded not only to keep this information a secret, but also to spend a lot of money funding disinformation campaigns, knowing that for the people to know the harmful consequences of their actions would cost them a lot of money.

As mentioned previously, externalities constitute a market failure. As far as examples for concepts go, the example of carbon emissions is as perfect as you can get. Neither consumers and producers include in their transactions the costs to third parties that climate change brings about.

1. Shannon Hall, "Exxon Knew about Climate Change almost 40 years ago", Scientific American, October 26, 2015. https://www.scientificamerican.com/article/exxon-knew-about-climate-change-almost-40-years-ago/

And the amount of third parties is considerable; namely, everyone who lives on the planet Earth. Everyone is affected by it, and everyone contributes to it. This is not to say that everyone affects it, and is affected by it, to an equal degree; there are vast differences between the per capita carbon footprints of different nations, and the effects of climate change in some regions pale in comparison to the effect on others.

Policies that attempt to put a price on the emission of carbon are called Carbon Pricing policies. The two most used forms of carbon pricing are carbon taxes, and emission trading systems. Over the past few decades, there has been a dramatic increase in the amount of such policies. Still, as of 2020, only slightly more than 20% of global carbon emissions is subject to any form of carbon pricing[2]. Moreover, many of these policies operate with (effective) tax rates that are far lower than is predicted to be necessary to keep climate change within acceptable limits[3].

It seems that, despite the increase in carbon pricing policies over the years, there is still a need to push for more action. A good place to start may be to determine the differences between the two most often used pricing policies: Carbon taxes, and Emission Trading Systems. The following section will detail both policies, as well as some of their disadvantages.

Carbon Taxes

Carbon tax policies are a carbon pricing mechanism inspired by the Pigouvian Tax[4]. Carbon emissions are recognized as being a negative externality, which means that there is a disparity between social and private costs. A perfect tax rate would converge social and private costs to the same point. After the implementation of the tax it will, depending on the exact form of the tax, decrease emissions in

2. The World Bank, *State and Trends of Carbon Pricing 2019*, Figure, (Washington, DC, DC: The World Bank, 2019): 25.

3. The World Bank, *State and Trends*, Figure, 26.

4. (placeholder) Dieter Helm, “Economic Instruments”, 208-209.

two ways. First, by decreasing the use of energy, and second, by increasing the amount of energy generated by low-carbon and non-carbon alternatives (natural gas, nuclear energy, renewable energy, etc.). Though the idea is simple, there are a variety of manners in which such a tax may be implemented. You can charge an excise tax on fuel, proportional to the amount of carbon that it emits. It is also possible to tax energy in general, but this does not have the previously mentioned benefit of encouraging a switch to low-carbon alternatives.

Real life examples of emission taxes:

So far, carbon taxes have been adopted mostly on the initiative of individual nation-states. Finland was the first to adopt this mechanism in 1990[5], followed by many other relatively small European states. Currently, taxes are responsible for the ten highest prices on carbon[6]. This does not mean high carbon costs is an attribute that all carbon tax mechanisms share; the carbon tax implemented in Japan operates on a per tonnage cost that is amongst the lowest of all carbon pricing systems[7]. This is at least partly compensated for by the fact that their range of coverage, nearly 70%, is amongst the highest[8]. It accomplishes this by levying the carbon taxes 'upstream'[9], meaning early in the production chain, for instance at power plants. By charging the tax here, you ensure that all their consumers of electricity, both households and businesses, pay the tax indirectly.

5. The World Bank, *Carbon Leakage*, Graph, 25.
6. The World Bank, *State and Trends*, Figure, 26.
7. The World Bank, *State and Trends*, Figure, 26.
8. The World Bank, *State and Trends*, Figure, 28.
9. Takeshi Kawakatsu, Takeshi, Soochoel Lee, and Sven Rudolph, "The Japanese Carbon Tax and the Challenges to Low-Carbon Policy Cooperation in East Asia" (Kyoto, Kyoto University: Graduate School of Economics. December, 2017), 5-6.

Emission Trading Systems

An Emission Trading System (ETS) is a carbon pricing policy that takes its inspiration from Coase[10]. In this case, the absorptive quality of the atmosphere, as well as liveable climate conditions, are recognized as property, over which individuals have rights. Carbon emission is seen as an infringement of these rights, as long as some form of compensation is not agreed upon. Recognizing the need for at least some carbon emissions to stimulate the economy, governments, representing the people, create so-called "emission permits" which entitle the owner to emit a certain amount of carbon into the atmosphere. Governments distribute them to companies and individuals, who may then exchange them amongst each other. How this is done exactly can take many forms. The permits may be allocated freely, they may be auctioned by the state, there may be a limit to the amount of permits that may be exchanged between companies, etc..

This is not to say that there are no commonalities between these systems; Many of them are what are called Cap-and-Trade systems[11]. They generally operate with a maximum number of permits (Cap), which decreases with scheduled intervals. They also operate in the presence of some form of market for these permits (Trade). By allowing companies and individuals to exchange permits, companies that create the most economic value per unit of emission are incentivized to buy more permits, while those that create the least are incentivized to sell them and to cut emissions accordingly. An extra level of economic efficiency is added if the same ETS operates in several countries, and between those countries, at the same time. Those countries that create the most value per unit of emission buy from those that create less.

10. Dieter Helm. "Economic Instruments", 209-212.

11. Robert N. Stavins, "Carbon Taxes vs. Cap and Trade: Theory and Practice", *Harvard Project on Climate Agreements*, no. 9 (2019): 4.

Real Life examples of ETS

The European Union Emission Trading System is one of the longest running international ETS in the world[12]. It operates using bundles of policies called "phases"[13]. The first phase started in 2005, and currently, the EU ETS is in its third phase, with the fourth set to start in 2021. It operates on a Cap-and-Trade system, where new permits are distributed to facilities through auction or for free, depending on specific considerations (e.g. Carbon Leakage)[14]. A portion of the permits is reserved in order to be allocated to new entrants, for free. The maximum amount of permits to be distributed lowers by 1.74% per year.

Every subsequent phase of the EU ETS has expanded the scope of the system, as well as its strictness . The number of countries involved in the EU ETS has grown over the years, and it now covers all countries in the European Economic Area[15]. New industries, like aviation, have been added as well. Aside from carbon emissions, the EU ETS also covers a number of other substances considered to cause harmful externalities, like Nitrogen dioxide and some types of acid.

ETS also seem to be the preferred choice of carbon pricing mechanism for states of the United States of America. As of 2019, absent federal action to install a carbon pricing mechanism, three states have voluntarily implemented their own ETS, with several more states planning to do the same[16].

12. European Commission, "EU Emissions Trading System (EU ETS)", European Commission, February 16, 2017, https://ec.europa.eu/clima/policies/ets_en#tab-0-0

13. European Commission, *EU ETS Handbook*, Luxembourg: Office for Official Publications of the European Communities, 2015, 4-7.

14. European Commission, *Handbook*, 60.

15. European Commission, *Handbook*, 20.

16. The World Bank, *Carbon Leakage* , 44-45.

Limitations of carbon taxes

Efficiency

Carbon taxes cannot guarantee that annual carbon emissions stay under a certain threshold, while ETS policies do[17]. This can make it a more reliable tool when determining the timeline necessary to accomplish certain goals, such as those stipulated by the Paris Agreement[18]. Moreover, ETS create additional opportunities for climate activists. Any individual or organization may purchase permits and choose to retire them, which effectively decreases that year's maximum allocation of permits.

Ethics

In contrast to emission trading schemes, carbon taxes take away more agency from individuals and companies. Companies are not allowed to choose the manner in which they adapt to the increase in cost. Under an ETS, a company might decide to delay carbon cutting investments for strategic reasons. They can do so by buying more permits, either from the distributing authority, or from other companies. Under a system of carbon taxes, however, they will have to pay the tax whichever strategy they choose. For individuals, the aforementioned ability to purchase and retire emission permits is not available to them.

17. It should be noted that under some constructions, ETS can also have situations where annual emissions are higher than the amount of permits distributed that year. This is because it may be possible for companies to save unused permits for later years.

18. United Nations. "The Paris Agreement". UNFCC, 2015. https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

Limitations of ETS

Efficiency

The main strength of the ETS, namely its flexibility through market mechanisms, can also be a weakness due to its relative unpredictability[19]. While carbon taxes operate with fixed prices, the prices of carbon in an ETS float freely (or within a range). Of course, carbon taxes also have a degree of volatility due to changing prices of carbon emitting fuels, but this goes for ETS as well. The result is that there is an extra factor of uncertainty that companies and individuals need to keep in mind. This makes it harder to know when carbon- and energy optimizing investments should be made, which creates inefficiency. Adding to the volatility and uncertainty of the ETS is also the concern that ETS are vulnerable to market manipulation[20], as well as theft.

Carbon taxes are relatively straightforward compared to ETS policies, both in terms of implementation and enforcement[21]. ETS policies, on the other hand, have to undergo a long process of bureaucratic negotiation in order to figure out the many details that go into that system. Such details include: The total amount of carbon, and the timeline of reduction, the amount of freely allocated permits, the proportion of permits that may be traded, etc. . It is worth noting, however, that practice has found that the costs involved with setting up trading systems have been relatively insignificant[22].

Ethics

Under Emission Trading Systems, it occurs quite often that it is not actually the polluter that ends up paying for the pollution. For instance, the EU ETS gives out free emission permits to most industries,

19. Robert N. Stavins, “Theory and Practice”, 13-14.
20. Robert N. Stavins, “Theory and Practice”, 15.
21. Robert N. Stavins, “Theory and Practice”, 17.
22. (placeholder) Robert N. Stavins, “Theory and Practice”, 15.

and especially those industries that it determines to be at risk of "carbon leaking", though the total amount of free permits has been slowly decreasing[23]. 'Carbon Leakage' means that, if they were to have to pay for them, these industries are likely to move to places with less strict regulations[24]. This would then cause economic damage to the original country, as well as possibly increasing carbon output overall. The idea that industries at risk of carbon leakage should receive free (or reduced rate) allocations of permits gives a strong incentive to the industries themselves to remain at such a risk. Companies could project the threat of moving overseas and thereby increasing their pollution by lobbying the governments of potential relocation sites to ease regulation, thereby making their threats more credible, which would keep their permit costs low, if not non-existent.

As a matter of justice, it may also be undesirable to adopt a system that is desired by industry to the extent that it is. Another reason for this, is that ETSs tend to provide "grandfathered" permits to incumbent industries[25]. This means that firms that have previously emitted GHGs get free, or perhaps discounted, permits to keep doing so in the future. This is not necessarily done directly proportionally to the amount of emissions in the past. Still, this tends to give large benefits to incumbents, as well as benefiting those that have so far done the least to address the issue of pollution. The EU ETS, for example, has used two ways of grandfathering[26]. First, emission rights are allocated to member states according to their share of emissions in the first phase. In addition, 10% of emission rights are reserved for additional allocation to countries with low per-capita income . Second, during phases 1 and 2 most permits were allocated freely to companies on the basis of their

23. European Commission, *Handbook*, 62.

24. European Commission, *Handbook*, 60.

25. Knight, Carl. "What Is Grandfathering?" *Environmental Politics* 22, no. 3(2013): 411-414.

26. European Commission, *Handbook*, 26.

past emissions. Since then, the latter has been replaced with a system called 'benchmarking'[27], which allocates permits on the basis of a firm's production efficiency in relation to the amount it pollutes

27. European Commission, *Handbook*, 47.

IV. Satz

In order to assess the two policies for their ethical merit and justifiability, they will need to be analysed through a framework. The nature of ethics is such that it is hard to quantify, and perhaps even harmful to do so. Moreover, the situation is made even more difficult by the fact that some frameworks automatically favour either a governmental or market approach to market failure. As such, I have chosen to start this analysis by outlining three perspectives on market failure. These include Satz's framework of noxious markets, Sandel's argument on corrupting commodification, and Nozick's analysis on the justifiability of government intervention. The following section will outline each of their perspectives respectively.

Noxious Markets

In her book 'The Moral Limits of Markets: Why Some Things Should Not be for Sale', Satz introduces the concept of a 'noxious market'[1]. A market can be deemed to be 'noxious' when it scores high on one or more of four parameters: Harmful outcomes for individuals, harmful outcomes for society, vulnerability, and weak agency. Though there are no empirical measurements and standards that can draw a line in the sand between 'noxious' and 'not noxious', the parameters do provide tools that can be used to analyse the appropriateness of markets in a given area. This is to the end of determining the limits that market forces should have, while also exploring elements of equality other than the distribution of wealth[2]. The following section will provide a short overview of Satz's

1. (PH) Debra Satz, *Why Some Things Should Not Be for Sale: The Moral Limits of Markets* (New York, NY: Oxford University Press, 2012), 91.

2. Debra Satz, *Markets*, 112.

four parameters for noxious markets, and will then analyse in detail where the economic instruments of the ETS and carbon taxes stand in relation to these parameters.

Harmful outcomes for individuals

As the name suggests, this parameter deals with any harmful outcomes, both physical and mental, that individuals may have to endure as a result of market operations. Of course, not all bad outcomes for individuals participating in certain markets can be said to be a fundamental, or problematic, fault of the market itself. If a person opens a restaurant but is unable to make a profit due to incompetence or bad luck, it would be unfair to blame the food service industry for the harmful outcome this person now suffers. There are, however, also situations wherein markets consistently undermine the interests, welfare, and agency of individuals[3] , whether they participate in the transaction or are instead a third party.

In the first instance, you can for example think of the tobacco industry. Even if a person is fully aware of the possible consequences of smoking, they may be unable to stop if they wish to due to the addictive properties of nicotine. This addiction is in the economic interests of tobacco companies, since it increases consumption of their products. Given that profit-maximalization is the first and foremost goal of any corporation, it seems unlikely that we can expect tobacco companies to change without collective action, for instance through government regulation.

In the second instance, there are the effects on third parties. These externalities do not need to be bad, as is the case with the often cited example of education. As a person becomes more educated, they do not only improve their own prospects, but also the ones of those around them, as their knowledge may be used to improve the lives of others in a myriad of ways. But, as mentioned previously, externalities can also have harmful consequences. The phenomenon of climate change is a good example for this. Fossil fuel companies, nor any of their consumers, can justifiably be accused of wanting climate change to happen, but it is still a scientifically undeniable result of market

3. Debra Satz, *Markets*, 94-95.

transactions. As a result, incredibly harmful outcomes to individuals are generated, both now and in the future.

Harmful outcomes for society

The parameter 'harmful outcomes for society'[4] can easily be misinterpreted as meaning the same thing as the first parameter, except now for a group of people. This is not what Satz means, however. Harmful outcomes for society refers to those market outcomes that make it harder for society as a whole to function. A good example Satz mentions is that of child labour[5] (p. 155). There are a multitude of reasons why this can be considered to be unethical, not in the least the harmful physical and mental consequences for the children in question, but for this parameter, Satz approaches it from a different angle. Child labour, she argues, inhibits a child's development, for instance because they are denied the chance at a proper education, and because they become accustomed to doing menial tasks and obeying their superiors.

Aside from the consequences to the child individually, this also harms society at large. It inhibits their capacity to engage as individuals in a 'society of equals' (p. 162), as Satz puts it. Child laborers, having been conditioned to be submissive and servile, do not have the same capacity to engage with the public sphere as those who were not subjected to labour at that age. If a society values political equality amongst its inhabitants, then regulation of these markets may be necessary if they undermine the possibility for people to be politically equal. This does not mean that these markets *must* be banned, but rather that they need to meet a certain threshold, though where this threshold lies is hard to say.

4. Debra Satz, *Markets*, 95-96.

5. Debra Satz, *Markets*, 155.

Weak agency and asymmetric knowledge

Weak agency and asymmetric knowledge refer to the possibility and capacity of agents to both have and process information, respectively[6]. Neoclassical economic theory assumes that all agents are fully autonomous and rational individuals[7]. This means that they have access to all information, and always make the decision that is best for their self-interest, independently of the decisions of others. It is easy to see that this assumption does not hold in reality. This does not immediately mean that all differences in information and its analysis are problematic, however. It is not unreasonable for companies to keep projects that they spent a lot of time and money on a secret, as its untimely revelation could mean that all their work was for nothing. Nor is it necessarily problematic for people to have different capacities for understanding available information. There is too much knowledge out there for even a million people to understand collectively. The specialisation of people to specific areas of knowledge allows us to free up our time for other endeavours, consulting them when we need to know something that would take us years to try to understand.

However, differences in knowledge and analysis capacity can certainly be very problematic. Consider the previous example of Child Labour. Weak agency is also a factor in the reason why we do not allow child labour. As Satz[8] notes, children do not yet have the cognitive capacity decide for themselves to engage in work that is in their self-interest. These decisions are usually made by parents or guardians. This lack of capacity, as well as self-determination, constitute weak agency on the party of children in a market of child labour.

6. Debra Satz, *Markets*, 96-97.

7. Elliot R. Weintraub, "Neoclassical Economics," Library of Economics and Liberty, accessed on 29/06/2020, https://www.econlib.org/library/Enc1/NeoclassicalEconomics.html.

8. Debra Satz, *Markets*, 157-159.

Vulnerability

Traditionally, economics assumes that all exchanges are voluntary. After all, why would a person agree to an exchange if it was not in their best interest to do so? As long as people are not forced to work at gunpoint, we should allow individuals to decide for themselves what is best. While there is some intuitive sense in such an explanation, it ignores that there are other ways in which a person may be coerced into accepting certain exchanges. In societies where there is a large gap in the levels of wealth between rich and poor, the range of choices available to each person may also differ significantly[9]. A person working in a sweatshop may be said to have chosen to do so, but when their alternative is that they cannot send their children to school, or to starve, or to lose their home, it seems to only have meaning semantically. In the absence of a meaningful range of choices, choices cannot be said to be free at all.

Even in cases that are not as dramatic as that of the sweatshop worker, coercion may take place. Even if you work a decent job, for a decent wage, your slice of the pie may be much smaller than the one received by your employer due to the relative difference in negotiation power. This is not to say that any and all differences in negotiation power should be outlawed, however. It is hard to see how markets could function under the condition that there are no power differences; the extreme limitation on the possible number of exchanges would render the market nearly useless. The parameter of vulnerability, like all parameters mentioned here, does not have a specific cut-off between problematic and non-problematic. Still, even in cases where the worse-off party is still pretty well-off, one might question the justification of particular distributions.

9. Debra Satz, *Markets*, 97-98.

Analysis Emission Trading Systems

The following segment will analyse emission permit markets on the basis of Satz's framework of Noxious markets, with mentions of Coase when it is relevant. All four parameters will be treated in order to assess its ethical justifiability.

Harmful outcomes for individuals

For markets that produce greenhouse gasses, this section would mention the detrimental effect that this has on people, both physically and mentally. It would mention the rising sea-levels, the droughts, and other extreme weather events that will become more and more likely as the level of GHGs increases in the atmosphere. Of course the interesting thing about the market in emission permits is that it does not actually produce emissions, and certainly not as an externality. You could say that the enforcement of the policy requires resources, including energy, and that it therefor also emits GHGs. This is really no different from any other type of regulation however, and certainly nothing in comparison to the permits it facilitates trade for.

Financially speaking, you could make an argument that this system could be harmful to individuals. Part of the brilliance of Coase Theorem is that it will theoretically lead to the same outcome no matter which party is initially assigned property rights. For the sake of the parties involved, however, it very much does matter who gets them. It is the simple difference between getting paid and having to pay, and can drastically alter their lives and also the way in which we view the matter of polluting. The question of who has to bear the costs of paying the property holder is one that is very much relevant when it comes to matters of justice.

Usually, we would say that the party that harms the other party is the one that should bear the costs, which in the example mentioned would be the polluter, namely the chemical plant. In the case of emission permits, the permits are auctioned by the state, which is supposed to represent the people. One can therefor say that the property rights of 'a liveable climate' or 'a proportion of the

atmosphere's absorptive capacity' have gone to the consumers, and not the producers. It is not always that easy, however, since consumers and producers are not two neatly separate parties. Many people work for companies affected by emission permit regulation, and therefore have different interests than they would have if they were merely a consumer.

The problem is exacerbated if the permits are given away for free, as they are done for what the EU ETS considers to be industries at risk for 'carbon leaking'[10]. In this case, the property rights for a liveable climate are freely given to the producers, and not the consumers. This is also the case with permit activism. Proponents of emission permits say that climate change activists may purchase emission permits to reduce overall emissions, but this effectively transfers the costs of the negation of the externality to the grieved party. Moreover, we must not forget that while climate change activists buy such permits to then sit on them and do nothing with them, producers make money of them. This gives the producers far more power to keep buying up permits. Besides, in the case where the companies received the permits for free, the requirement that consumers pay the companies to retire permits seems akin to exploitation, since the company makes money off of consumers on the threat that it would use them to pollute, or sell them to another company that would pollute, if they did not buy them.

Harmful outcomes for societies

The entry of the market and of business interests into domains of life that, before, were not considered to be appropriate for such things is a phenomenon that has long been opposed by Michael Sandel[11]. In the section on Sandel, I will detail how he tackles this issue, how it relates to this specific parameter, as well as to climate change in general.

10. European Commission, *Handbook*, 60.

11. Michael J. Sandel, *What Money Can't Buy: The Moral Limits of Markets*, (St. Ives, United Kingdom: Penguin Books, 2013), 5-15.

Weak agency and asymmetric information

An example of the potential effects of weak agency relating to Coase Theorem can be seen by looking at the earlier-mentioned example of the chemical plant on the river (Woods, 2010): Given the chemical plant's necessary specialization in chemicals, it would not be unreasonable to expect that the it would be more familiar with the workings of said chemicals than the fisher workers. In the negotiations between the two parties it might thus be the case that the fishers do not fully understand the damage that can be done to their fishing grounds, both short-term and in the long run. This would cause a divergence from the maximum social benefit.

It is easy to see how this relates to the policy that owes its intellectual heritage from Coase Theorem. As mentioned earlier, Exxon-Mobil[12] (Hall, 2015) has known about the possible harmful outcomes of greenhouse gas emissions for decades. The choice not to share this knowledge with the outside world, and to instead fund disinformation campaigns, is a clear example of their use of superior knowledge to attain goals that were beneficial for them, but extremely harmful to others. Should we have known of the consequences of carbon emissions at that time, things may very well have turned out differently.

The spreading of misinformation of companies like Exxon-Mobil has the potential the shape the debate on climate change in their favour. If less people agree on the existence of the problem, or the degree to which it is a problem, the public mandate of the government to perform climate action weakens. In the case of the ETS, this would then lead to larger maximum allowances of emission permits, as well as the distribution of more free permits. It should be noted that it is also possible for the spreading of misinformation to impact the level of taxation on carbon in a very similar manner.

12. Shannon Hall, "Exxon". https://www.scientificamerican.com/article/exxon-knew-about-climate-change-almost-40-years-ago/

While it is possible that there exists weak agency in the relation between those engaging in an emission trading system, and those on whom the mandate of the government depends, it is not likely that this is the case within the ETS as well. Though there likely is a not insignificant difference both in information possessed, as well as the capacity to analyse it, between companies operation within emission trading schemes, it does not seem particularly problematic. Any one individual has limited resources and capacity to acquire and process information, respectively. This makes us, as individuals, vulnerable to exploitation. Companies, however, consist of a multitude of individuals and of considerable resources. Given that ETS usually only include companies of a certain size, like with the EU ETS[13], and not small mom-and-pop businesses, it seems reasonable to assume that weak agency and asymmetric information will not be a general feature of ETS.

Vulnerability

This parameter seems relatively unproblematic in the case of emission trading. The parties involved in these schemes are relatively large companies, which is far different from cases of for instance sweatshop workers. Assuming a system where permits are not allotted freely, it seems theoretically possible for large and wealthy companies to outbid smaller ones to the point where they lose large amounts of their market share, potentially causing them to go out of business. This would take an incredible amount of money, however, and so it remains the question as to whether it would actually happen in real life.

Analysis Carbon taxes

Satz's framework was designed for the analysis of markets, and so it lends itself less well to a critique of government taxes than of market interactions. That being said, some of the concerns mentioned

13. European Commission*, EU ETS Monitoring, Reporting, Verification and Accreditation – Quick guide for Competent Authorities* (Luxembourg: Office for Official Publications of the European Communities, 2017): 3.

in her parameters are still able to shed light on concerns with emission taxes. The following section will highlight such concerns.

Extremely Harmful outcomes

Just like many other economic theories, the theory of Pigouvian taxes presumes that all parties are perfectly informed. In the case of Pigou this is necessary in order to determine the tax rate necessary to achieve maximum efficiency[14]. In real life, however, it is often very hard to say exactly how harmful (or beneficial) certain phenomena are, making it less than likely that the correct tax rate will be chosen. Moreover, the factors involved are likely to change over time, so that even if you had established the theoretically correct tax rate at point A, it will soon be inappropriate for the new situation. Seeing as how public policy tends to lag behind current affairs, it is not unthinkable for the tax to be significantly different from the socially optimal level, a significant amount of the time.

In contrast, the market has the potential to adapt to these changes on its own. Hayek[15] thought that government regulation of the kind that Pigou proposed would necessarily lack efficiency because it would not be able set the socially efficient tax rate, and that it would not be able to shift it accordingly as circumstances determining the state of the economy change. Paraphrasing Hayek, he argues that all individuals in society form sources of knowledge of, amongst others, 'local conditions'[16]. Through communication with other sources of knowledge, they naturally adjust to changing circumstances. None of these individuals need to know the overarching causes of price fluctuations, like a central economic planner would. They simply need to react according to their own needs and wants, and the market will find a new equilibrium by itself.

14. Harvey S. Rosen, Ted Gayer, and Abdülkadir Civan, *Public Finance*, 84.

15. Friedrich A. Hayek, "The Use of Knowledge in Society", *The American Economic Review* 35, no.4 (1945): 519-530.

16. Friedrich A. Hayek, "Knowledge", 522.

Another potential problem with Pigouvian taxes is its potential to cause a disproportionate loss to people with lower incomes[17]. For instance, when applying a Pigouvian tax to the tobacco industry for its harmful effects to smokers and those around them, the price per packet of cigarettes also rises. This increase in costs mean relatively more to a poor person than to a rich person, provided that they smoke the same amount. It is possible that this can be offset by subsidising the income of poor people, but this will be a part-offset, since the increase in income will likely mean that they purchase more cigarettes than they would have if they received no such subsidy. This is an additional factor that may negate the potential of the earlier-mentioned 'double-dividend effect'. I would argue that the point of the double dividend is not necessarily to completely offset but at the very least lower the economic damages, while helping to achieve the more important goal of ensuring a sustainable future. The idea that climate action needs to be painless seriously hampers our ability to take the appropriate actions, and indeed only causes more harm in the long run.

17. [17] Katri Kosonen, and Gaëtan Nicodème, *Taxation Papers: The Role of Fiscal Instruments in Environmental Policy* (Luxembourg: Office for Official Publications of the European Communities, 2009), 8.

V. Sandel

There has been a trend, Sandel argues, in the United States and many other developed countries. This trend has been the entry of the market into domains of life previously thought not to be suitable for it[1]. These domains include, but are definitely not limited to: paid pregnancy surrogacy, political influence, 'free' cultural events, organ transplants, etc.. To the entry of the market into these domains, Sandel raises two objections: arguments from coercion, and arguments from corruption[2]. The first has to do with the limited range of options available to those who engage in the market. As Sandel argues, the decision to sell a kidney may be "forced" if it is their only alternative to starving. The argument from coercion is very close to that of Satz's vulnerability parameter, which is why it will not be explored any further here. The second has to do with the way in which we value a non-market good, and the way in which this changes if market forces are introduced. The latter objection, Sandel argues, is fundamentally different from the former: While the former may be addressed by changing the background conditions against which the market operates, the latter will hold no matter what background conditions are present.

Sandel argues that norms are influenced by markets[3]. More specifically, that the introduction of markets for goods changes people's attitudes towards them, changing societal norms in the process. There are many interpretations and understandings of what a norm is, but their shared element across these various perspectives is, as defined by Bicchieri[4], "a behaviour that is collectively

1. Michael J. Sandel, *Moral Limits of Markets*, Book, 5-15.
2. Michael J. Sandel, "Moral Limits of Markets", Lecture, 94.
3. Michael J. Sandel, *Moral Limits of Markets*, Book, 113-114.
4. Christina Bicchieri, "Norms, Conventions, and the Power of Expectations" in *Philosophy of social science: a new introduction*, ed. Nancy Cartwright and Eleonora Montuschi (Oxford, United Kingdom: Oxford University Press, 2014), 209.

approved or disapproved in a group or population and is enforced by sanctions". Norms are social constructs, and it can be very easy to regard them as relatively inconsequential in comparison to physical threats produced by markets, such as pollution. Yet, the influence that norms have over our everyday lives are not something that should be underestimated. Whether consciously or not, the expectations that people have of us, as well as our expectations of their expectations, shape our lives on a day-to-day basis

Though some of Sandel's work is self-admitted speculation[5], there is some empirical evidence that this is indeed the case. A study by Falk and Szech (2013) found that the introduction of market forces caused a larger amount of participants to accept transactions with negative externalities, in this case the death of a mouse. Falk and Szech themselves suggested that this may be due to a difference in attitudes towards the mouse between market and non-market settings. Another example, quoted by Sandel himself, is the case of a day-care deciding to hand out fines to parents who were late to pick up their children[6]. Instead of seeing the amount of late pick-ups decrease, as they had expected, it actually went up. This has been hypothesized to be due a change in attitude towards late pick-ups. First it was a source of embarrassment, but after the fines were introduced, some parents felt that the paying of the fine absolved them of the responsibility to be on time.

Analysis Carbon Pricing Mechanisms

A defining feature of Sandel's objection to the commodification of certain goods on the basis of corruption is that all goods have to be treated on a case-by-case basis. Before you can make a judge a good to be unsuitable for market interaction, you need to analyse it specifically. No general rule will

5. Michael J. Sandel, *Moral Limits of Markets*, Book, 78.

6. Uri Gneezy, and Aldo Rustichini, "A Price Is a Fine", *The Journal of Legal Studies* 29, no. 1 (2000): 1-18.

be able to answer it for you, because, so Sandel argues, there is not just one mode of valuing goods, and that these modes are not commensurable to one mode of valuation. Commensurability in the context of economics refers to a general tenet of economics, namely that all modes of valuation can be expressed by utility (which is usually expressed in monetary terms).

It seems only appropriate, then, that the topic of emission permits gets the same treatment afforded to other heretofore non-commercialized domains of life. In contrast to Satz and Nozick, we have a direct source of Sandel's opinion on markets of emission permits. In 1997, Sandel wrote an opinion piece for the New York Times responding to the recently concluded conference in Kyoto[7]. Sandel condemned the insistence of the United States to create a global emissions trading market on the basis of three reasons. First, because of the possibility for legal loopholes. Second, because treating pollution as a commodity removes the appropriate moral stigma associated with it. And third, because it undermines the sense of shared sacrifice, which Sandel believes to be necessary in order to facilitate continued international cooperation.

In his second argument against global emission markets we find an example of the aforementioned 'argument from corruption'[8]. In order to illustrate his argument, Sandel distinguishes between fees and fines[9]. A fine is a monetary punishment for the violation of some law or regulation. If a person violates such a regulation, like when they unjustifiably park in a handicap spot, they have to pay money. Crucially, however, the punishment carries with it an aspect that makes it different from fees: namely the normative judgement that this person should not have done this thing, and that the paying of the fine does not absolve them from wrong they committed. In contrast, fees do not carry this same normative judgement. If something is considered a fee, it is considered akin to a business expense. Sandel argues that carbon pricing methods transform the

7. Michael J. Sandel, "It's Immoral to Buy the Right to Pollute", *New York Times*, December 15, 1997, 23.

8. Michael J. Sandel, "Moral Limits of Markets", Lecture, 94.

9. Michael J. Sandel, *Moral Limits of Markets*, Book, 65.

costs of pollution into a fee, rather than a fine[10], removing the normative judgement we might otherwise associate with it.

The reason why this should matter, is because our attitude towards problems to be solved matter for the efficacy of the solution. If industrial carbon emissions are regarded as a simple business expense, rather than as an phenomena that is harmful in itself, it has a real chance of eroding our resolve to combat the issue. If our resolve to combat climate change erodes, then we take very necessary pressure off of governments and companies to safeguard our future.

From the perspective of Sandel, then, systems of carbon pricing are morally problematic. This goes for both taxes and markets in emission permits. There is good reason to believe, however, that taxes are less problematic from his perspective. First, because it (at least partly) removes the two other problems Sandel mentioned in his opinion piece. The first because, as mentioned earlier, a carbon tax is simpler than an ETS[11]. The third because it does not allow for the trading of the burden of emission reductions. More important, however, is that taxes are also less corruptive than markets in emission permits. In contrast to market commodification, taxes generally do reflect a negative attitude towards the goods they are levied upon. In the Netherlands, Luxury products are taxed more than basic necessities[12]. Cigarettes are taxed more than chocolate[13] [14]. Taxes are often used to

10. Michael J. Sandel, *Moral Limits of Markets*, Book, 75.

11. Robert N. Stavins, "Theory and Practice", 17.

12. Belastingdienst, "Goederen met 9% btw", Belastingdienst, March 16, 2020, https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/btw/tarieven_en_vrijstellingen/goederen_9_btw/goederen_met_9_btw

13. Jellinek, "Hoeveel accijns wordt er geheven op een sigaret?", Jellinek, May 11, 2020. https://www.jellinek.nl/vraag-antwoord/hoeveel-accijns-wordt-er-geheven-op-een-sigaret/

14. Belastingdienst, "Tarieven en Vaststelling van de Tarieven". Belastingdienst, July 31, 2019, https://www.belastingdienst.nl/bibliotheek/handboeken/html/boeken/HA/tabak_ruwe_en_gedeeltelijk_bereide-tarieven_en_vaststelling_van_de_tarieven.html

discourage certain behaviour, which immediately brings to mind a negative connotation when they are instituted.

VI. Nozick

Robert Nozick was a philosopher who is best known for his brief, yet highly influential, work in the field of economic philosophy. His seminal work "Anarchy, State, and Utopia"[1] sets out to show how a minimal state could arise through the application of what he calls the "Principles of Justice"[2]. First, the principle of justice in acquisition. This principle states the manner in which an unowned thing may become owned, thereby creating rights to that thing for the one who makes the acquisition. The second is the principle of justice in transfer. Any object that a person has justly acquired may be exchanged voluntarily with another person, on any conditions as they choose, as long as these do not violate natural law. The third is the principle of rectification. Any violation of the previous two principles entitles the wronged party to the restitution of their property. Having shown that the minimal state may be established in accordance with these principles, Nozick goes on to argue that the minimal state is also the maximally allowed one. For any state beyond the minimal one to endure requires the violation of (at least some) of these principles.

Nozick's philosophy is based on individuality. He argues against the concept of a social good, stating that: "There are only individual people, different individual people, with their own individual lives. Using one of these people for the benefit of others, uses him and benefits the others. Nothing more."[3]. People are allowed to work together to achieve goals that they consider to be in the interest of the common good, such as equality of opportunity, or equality of wealth, but no one may be

1. Robert Nozick, *Anarchy,* 1-334.
2. Robert Nozick, *Anarchy*, 150-153.
3. Robert Nozick, *Anarchy*, 32-33.

forced to participate in it, even if they still benefit from it (free-rider problem). More specifically, no one who has not already voluntarily accepted an obligation to participate may be forced to do so.

Nozick first recognizes the problems posed by externalities in the chapter "Prohibition, Compensation, and Risk"[4]. In this chapter, Nozick discusses the types of boundary-crossing actions that may be prohibited, and those that may be done given that compensation is payed to the ones who have their boundaries crossed. Some actions, when not prohibited, he argues, run the risk of increasing fear in the general population, which cannot be compensated for (at least not without major transaction costs).

Later, on the topic of pollution, Nozick suggests that the externality may be rectified by compensation of the ones that are hurt by the polluting activity, by the profiting party[5]. In cases where the harm imposed on each individual is lower than the transaction costs of gaining compensation, the grieved parties may pool together their resources in a class-action suit.

The Minimal ETS

I suggest that Nozick's conception of the mitigation of externalities allows for the existence of a market in emission permits. He has shown that the minimal state may arise through the application of the principles of justice in holdings. This happens through the creation of protective agencies[6], which settle disputes amongst members, and punishes those that cross the boundaries of members. Over time, he argues, a dominant protective agency will form. This may be a single agency, or a federation of different agencies that work together to settle disputes between them. Those outside

4. Robert Nozick, *Anarchy*, 54-87.
5. Robert Nozick, *Anarchy*, 79-81.
6. Robert Nozick, *Anarchy*, 88-119.

of the dominant protective agency will feel attracted to join, since the quality of services that the agency can offer stands in proportion to the amount of members that it has.

Pollution may be regarded as a boundary crossing activity. As mentioned previously, this externality, as well as the associated externality of climate change, has detrimental effects on the health of individuals. Since, as Nozick argues, it is unrealistic to prohibit all polluting activities in any economy[7], it seems that some form of compensation is in order. Since protective agency is designed to protect against boundary crossing activities, it seems reasonable to assume that pollution is something that members would be protected against (alongside the more usual boundary crossing events, such as theft and murder). Some polluting activities have a global effect. The effects of one polluter may in these cases be felt equally for all individuals on the globe. As such, the minimal state may represent property rights to the atmosphere equal to its proportion of the total individuals living on the earth. Since boundary crossing activities may be allowed through voluntary exchange[8] (p58, Nozick), the minimal agency may negotiate on behalf of its members to sell the rights to have these boundaries crossed to individuals willing to pollute. They may also sell them to other protective agencies, should these exist.

Though there are nowadays no nations that one may determine to be a Nozickean minimal state, it seems to me that the logic of the argumentation still holds for nations more extensive than this. Because even though these states violate Nozick's rules of justice in holdings, the emission permits system itself can still be allowed. Surely Nozick would not demand that there can only be systems in compliance with the principles of justice in holdings if there is a minimal state, so that he expects us to first achieve this minimal state, before such a system is acceptable.

7. Robert Nozick, *Anarchy*, 79.

8. Robert Nozick, *Anarchy*, 58.

Nozick does mention a problem with selling the right to pollute, namely the fact that a central decision making apparatus must determine the maximum amount of pollution to be sold[9]. It seems to me, however, that this is something that can be determined through negotiation amongst different states, or by the members of the dominant protective agency, should there only be one. In the first situation, a maximum global emission amount can be determined, after which each protective agency gains a right so sell an amount of this maximum, proportional to the amount of members that it has. In the latter situation, the dominant protective agency has an interest to strike a compromise on the maximum amount of emissions between its members, since they may decide to leave the agency if it does not decide to put a limit in place, or if the limit is too strict (this stage of internal bargaining would also take place in the first situation, before negotiation between agencies commences).

Beyond the minimal ETS

There are many aspects of real-world ETSs that are left unjustified by the current explanation. It seems unrealistic that the practice of grandfathering, as mentioned in the chapter on climate change, would be justified by any of the principles of justice in holdings. Bovens[10] (2012), drawing inspiration from, amongst others, Nozick, constructs a Lockean defence for grandfathering. His argument aims not only to provide justification for grandfathering on the basis of practicality, efficiency, and politics, but also on the basis of morality. He claims that you can view the atmosphere's capacity to absorb GHGs as a "commons", much in the same way as it is done in the traditional example of

9. Robert Nozick, *Anarchy*, 81.

10. Bovens, Luc. "A Lockean Defence of Grandfathering Emission Rights" in *The Ethics of Global Climate Change*, ed. Denis G. Arnold (Cambridge, United Kingdom: Cambridge University Press, 2011), 124-144.

homesteading[11]. Instead of gaining entitlement to a certain piece of land after the commons run out, the case of the atmosphere entitles previous polluters to a certain quota of emissions.

The moral justification Bovens hopes to offer remains unconvincing, even within the context of Lockean property rights. Property rights to land represent a right to something very tangible, property rights to fishing quotas represent the right to the tangible product of fish. The absorptive capacity of the atmosphere, however, represents an intangible phenomenon.

It is unclear to me why, even under Lockean provisions, historical appropriation of this absorptive capacity should entitle someone to a larger portion of it in the future. Every moment, the absorptive capacity of the environment is renewed, creating a new commons to be appropriated. Historical polluters may participate in this process, but they may not claim a larger share of a new commons, simply on the basis of this.

Carbon Taxes

Under the minimal state, there are no taxes. The cost of the maintenance of the minimal state are indeed payed by its members, but these do not have a redistributive aspect to them. The dominant protective agency provides its members with protection against boundary crossing actions, but does not devote resources towards some conception of a social good. According to Nozick, taxes are in violation of his principles of justice in holdings, because they fail to respect a person's rights to decide for themselves what to do with the resources taken from them[12]. Moreover, it attaches a differing value to the goals and wants of each individual. Those who desire more material possessions are forced to pay more taxes, and in doing so are inhibited in realizing their wants. While

11. Homesteading is a practice whereby people are allowed to claim a piece of land that no one holds a legal claim to. It is perhaps most famous from the Homestead Acts in the U.S.A. See also: history.com editors, "Homestead Act", history, August 15, 2019, https://www.history.com/topics/american-civil-war/homestead-act

12. Robert Nozick, *Anarchy*, 167-174.

people who do desire more leisure, and fewer material possessions, are not inhibited in realizing their wants in a similar manner.

VII. Conclusion

The discovery of fire, the invention of the agriculture, written language, and the printing press; All fundamental turning points in human history. I believe that, if we succeed, the struggle to deal with climate change will be counted amongst them. A creation of a global consciousness where humanity starts to understand its influence on a global scale, and develops the responsibility to use it correctly. The accomplishment of this perhaps slightly utopian mindset requires that we deal with climate change in the right manner. This means not only that the methods we use work, but also that they morally fitting to use in the first place.

In this essay, I have discussed two methods, both carbon pricing mechanisms; Carbon taxes, and Emission Trading Systems. I have explained their relation to the intellectual heritage of Pigou and Coase, as well as their workings in practice. These mechanisms, when subsequently analysed through the frameworks and perspectives of Debra Satz, Michael Sandel, and Robert Nozick, both display distinct benefits. Carbon taxes largely avoid the problem of noxious markets, as well as the corruptive force of commodification. ETS, on the other hand, shows more respect for the agency of both individuals and corporations, and can be possibly arrived at through a process of exclusively voluntary cooperation.

Ultimately, I believe that neither of them can be said to have an incommensurable advantage over the other. As a result, it seems that the factor of efficiency may need to take the upper hand. As mentioned previously, ethical considerations also play a role in the success of policy. The extent to which this is the case is not a matter that this thesis is well equipped to handle, however, and should be left to empirical research. It is important to remember that ethical considerations, while laudable, can never form a perfect substitute for a plan that better accomplishes the same goal, by other means.

Appendix

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