Master's thesis

NTNU
Norwegian University of Science and Technology
Department of Sociology and Political Science

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Do development aid agencies practice what they preach?

Analysing the effects of official development aid on sustainable development, 1989 – 2018

Master's thesis in Political Science
Supervisor: Indra de Soysa
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Abstract

Ever since the World Commission on Environment and Development's report Our Common Future was published in October 1987, sustainable development has come to pervade every part of society. Everything – from your local corner store to world politics – either prides itself with being sustainable or promoting sustainability, and development assistance is no exception. In addition to promoting growth and alleviating poverty, development assistance agencies have taken on the task of fostering sustainability, in accordance with the many targets and goals set for world development. Using OLS analyses with fixed effects and robust standard errors, on data on official development aid from the DAC members and various measures of weak and strong sustainability from roughly 140 countries in the 1989–2018 time-period, I examine whether aid agencies are following through on their promises of sustainable development promotion. In addition, Norway as an aid agency is given a special focus to examine the assertion that it is performing better than the other donors. To control for a possible sample selection bias, the Heckman two-step model is applied to analyse the effects of Norwegian development assistance. I find no substantial effects of aid from the DAC members other than Norway on neither weak nor strong sustainability. Norwegian aid does on the other hand show a measurable negative effect on per capita greenhouse gas emissions, robust to selection bias, indicating that Norwegian aid promotes strong sustainability, and thereby supporting the claim that Norway is a 'better' donor.

Acknowledgements

My deepest gratitude goes to my advisor Professor Indra de Soysa. Without his passionate teaching, especially in the international political economy class during the fall of 2019, my interests for this field of research may never have been properly awakened, and without him supervising the writing of this thesis, there is no knowing what the final product would have looked like – if there indeed would have been a final product to look at at all. His knowledge of both the field of research and of the technical statistical tools that makes up the foundations of this thesis has been invaluable, but most of all has his ability to stay relaxed and positive throughout the process shown me that there are no reasons to fear undertaking what at first may seem a mammoth task.

Besides my advisor, Jannicke Fiskvik, Ph.D. has been of tremendous help, both with literary recommendations and proofreading, and even more so with her insightful comments and suggestions in our discussions towards the completion of this project. Finishing this thesis has at times seemed a daunting task, and her words of encouragement have meant a lot to me.

Last but not least, my dear Kjersti has been invaluable throughout the whole process of my graduate studies. Without her supporting and motivating me, this thesis would probably not have been completed – at least not on time. Living under the same roof as me during the writing of this thesis has not always been a bed of roses, but she has kept positive and encouraging, even though she at times has had to drag me through it. For that I am grateful.

I am thankful for all the help I have received. Any remaining errors are my own.

Matias Saue Romundset, June 2020

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Abbreviations

AAPL	Aid agency performance literature
AEL	Aid effectiveness literature
DAC	Development Assistance Committee
GDP	Gross domestic product
GHG	Greenhouse gas
GNI	Gross national income
IMF	International Monetary Fund
IMR	Inverse Mills ratio
LDCs	Least developed countries
LICs	Low income countries
NATO	North Atlantic Treaty Organisation
ODA	Official development aid
OECD	Organisation for Economic Cooperation and Development
OLS	Ordinary least squares
SD	Sustainable development
TSCS	Time-series cross-sectional
UN	United Nations
V-Dem	Varieties of Democracy

1 Introduction

Ever since the First High Level Forum on Aid Effectiveness in 2003 in Rome, the effectiveness of development aid has been under scrutiny. For good reason, one might argue, as the world's total aid spending between 1960 and 2013 amounted to approximately US$4.7 trillion in 2013 prices (Barder, 2014), and more aid has been given since then. As such, one might also argue that the results provided by aid effectiveness research has a noble cause: Streamlining the aid flows from the rich to the poor will not only help the poor get the assistance they need to develop, but also potentially save the rich from allocating funds to inefficient causes, thus both allowing the rich to save their money for effectful projects while also giving the poor a better chance to develop with the assistance that is given them. In short, the results the aid effectiveness research provides can make the world a better place – of course depending on the research's findings being used in policy making.

In addition to the forums on aid effectiveness, of which there have been several, the United Nations in 2000 developed the Millennium Development Goals which were succeeded by the Sustainable Development Goals in 2015. These are in place to aid the world's development. Sustainability is a large part of the much-needed development because economic growth and poverty alleviation coming at the expense of the planet would be self-defeating. One of the challenges when assessing aid effectiveness is the lack of reliable indicators to measure the impact of aid dollars on the intended beneficiaries, therefore researchers are left with proxies and theoretical arguments to assess the effectiveness and quality of aid (Easterly & Williamson, 2011, p. 1932). This also applies to measures of sustainable development. This thesis uses the rates of natural resource depletion and atmospheric pollution as proxies for measuring how aid might impact weak and strong sustainability.

Ever since the World Commission on Environment and Development published its report 'Our Common Future' (World Commission on Environment and Development, 1987), sustainable development has been a focal point of world development, and is now thought to be the 'international community's most urgent priority' (United Nations, 2020c). Economic development and environmental sustainability, however, do not always go hand in hand. Thus, sustainable development indicates balancing between economic prosperity and environmental friendliness. But one could also argue that sacrificing economic development today might result in a safer tomorrow, therefore sustainable development should be seen as an investment, rather than a sacrifice.

This thesis examines the relationship between development aid and sustainable development, to uncover whether aid agencies are in fact working towards sustainable development, or whether the apparent focus on sustainable development is merely rhetorical. This thesis takes a closer look on Norway to examine whether the claims that Norway stands out as a 'better' donor than others, and whether Norwegian foreign policy actually emphasises sustainable development. Arguably, Norwegian officials recently have been directing the focus of Norway's foreign policy towards sustainable development, and this is therefore a timid question to ask. Using time-series data on official development assistance and sustainable development, this thesis sets out to answer these questions.

1.1 Why Norwegian aid?

Easterly and Williamson (2011) set out to investigate whether aid agencies follow through on the statements and promises they make, and find that, sadly, the measurable effects of development aid are far from what the aid agencies claim to be working towards. According to their findings, the fact that the aid agencies' expressed emphasis on good governance with the end of the Cold War did not in turn lead to a decrease in aid flows to corrupt or non-democratic regimes in the decades that followed (2011, pp. 1942-1943). Moreover, neither did the focus on 'poverty selectivity' (Collier & Dollar, 2002) of the 2000s result in the LDCs and/or LICs receiving a greater share of the aid (Easterly & Williamson, 2011, pp. 1944-1945). In short, aid was either being purposely misused and/or had little impact on the intended purpose, which was to pull the poor countries out of poverty.

One may very well argue that the buzzword of today is sustainable development (e.g. Park, 2011), and that aid agencies would want to promote their aid as being 'sustainable' in order to attract support from both the public as well as the international aid community. In 2009, climate change mitigation-related aid represented 7.4 percent of the DAC members' total bilateral ODA commitments (OECD, 2011), and in 2015-16, 21 percent of the total global ODA budget went to climate financing (Carty, Le Comte, & Özerdem, 2018).

The same trend can be seen in Norwegian aid allocation by sector. In 1989, the environment and energy sector represented seven percent of Norway's total aid budget. In 2009 the share had risen to nine percent, and 13 percent in 2019 (Norad, 2020). Additionally, the Program Committee of the Norwegian Conservative Party (Høyre) proposed to increase the Norwegian climate aid budget to NOK12 billion, effectively doubling the share of climate aid (Darrud & Berge, 2020). One interpretation of this development in general, and the proposal in particular, is of course that Norway cares about the environment, and wants to help promote

green development in the rest of the world. On the other hand, Norway may be wanting to appear as an advocate for the environment to the world community, both because of the position the country holds as a long-time 'strong global advocate of climate change mitigation' (International Energy Agency, 2017, p. 9), and as a way of ingratiating itself to the UN, as Norway is applying for a seat in the UN Security Council in 2021-22. This makes Norway an interesting country to study, both because of its history of being a willing and hard-working actor in the international community, and because of its tradition of being a generous aid donor.

1.1.1 Norway as an international actor

In addition to being highlighted as a 'good donor' in the aid effectiveness literature (AEL) (Alesina & Dollar, 2000; Beech, Kwak, & Tang, 2015; Felice, 2014), Norwegian foreign policy has been characterised by a dualism of *realpolitik* and *idealpolitik* (Harpviken & Skjelsbæk, 2010; Toje, 2010; Østerud, 2006), with the idealpolitik as a combination of self-interest and altruism becoming more integrated in Norway's foreign policy as the international situation is growing more complex and unpredictable (Berger, 2006; Knutsen, 2007; Skånland, 2009).While the realpolitik is grounded in the country's membership in the defence alliance NATO, the idealpolitik is reflected in the perception of Norway as a peace nation, promoting democracy and human rights.

Norway's history as an aid donor began in the early 1950s (Østerud, 2006) with what was known as the 'India fund' (Ministry of Defence, 2018). According to his (rather pessimistic) walkthrough of Norwegian aid history, Østerud (2006) describes how Norway has gone through several phases of aid contribution, following the general trends in the international aid community: 'It has, consecutively, been industrialisation support, an emphasis on agricultural development, population control, "new economic world order", poverty-oriented aid, commitment to local community development, and emphasis on institutional development' (Østerud, 2006, pp. 306, [my translation]).

The perception of Norway as a peace nation reached its all-time high with the Oslo Process, which, alas, did not result in peace between Israel and Palestine. Nevertheless, it can still be considered a major success for Norway, as the small country in the outskirts of Europe suddenly found itself in the centre of attention, epitomised by former foreign minister Johan Jørgen Holst shaking hands with US President Clinton, Palestinian President Arafat, and Israeli Prime Minister Rabin in front of the White House (Wohlforth, de Carvalho, Leira, & Neumann, 2018). Norway's idealpolitik may be ideal in essence, but the realpolitikal bias is not to be underestimated. The country being a small middle power in the far north of Europe could be in

danger of being 'left out', thus obtaining status and recognition is a way of asserting itself in the international community (Wohlforth et al., 2018).

Besides the Oslo Process, Norway's other great triumph on the international arena is the 'Our Common Future' report published by the World Commission on Environment and Development in 1987 (World Commission on Environment and Development, 1987), commonly known as the Brundtland report (Jarvie, 2020), as the commission was chaired by the former Norwegian prime minister Gro Harlem Brundtland. The report became widely renowned, and laid the foundations for the Rio Summit in 1992 in Rio de Janeiro, which led to the creation of the UN Commission on Sustainable Development later that year (Jarvie, 2020). Arguably, the Norwegian participation in such an influential report has led to Norway being able to bask in the status of being an advocate for sustainable development in its foreign policy. At the UN Framework Convention on Climate Change in late 2007 in Bali, the government launched Norway's Climate and Forest Initiative (NICFI), and former Norwegian prime minister Jens Stoltenberg announced that up to NOK 3 billion would be allocated annually to reduce deforestation (Norad, 2018). Since then, Norway has positioned itself as one of the main contributors to green and sustainable development, e.g. by being the sixth largest contributor to UN operational activities for development in 2017 (Regjeringen, 2020), and the third largest contributor to the UN's Green Climate Fund in the years 2015–2018 (Iversen, 2020). These contributions should be seen in light of Norway's application for a seat in the UN Security Council, and thus what seems as Norwegian idealpolitik very much becomes realpolitik when one acknowledges the interests at stake.

1.2 Previous research

The aid agency performance literature (AAPL) is a rather new strand in the research field of development and development aid. As Easterly and Williamson (2011, p. 1931) point out, unlike actors in an open market, 'aid beneficiaries have no vote and no purchase decisions by which they could communicate dissatisfaction to aid agencies', which makes one of the reasons this kind of research is useful. The aid recipients rely on the critical voice of the researcher to ensure that development aid is optimised. The aid effectiveness literature (AEL) dates some 20 years back – the 'official launch' being the aforementioned 'First High Level Forum on Aid Effectiveness' in 2003 in Rome, organised by the Organisation for Economic Cooperation and Development (OECD) (Palagashvili, 2019) – with some of the main contributions still today being the ones published in the early 2000s. Hansen and Tarp (2001) concludes that foreign aid and economic growth is correlated, which support their findings from the year before (Hansen

& Tarp, 2000), but their findings are highly dependent on the choice of estimator and control variables. Burnside and Dollar (2000) find that foreign aid is effective at promoting growth, but that the effect is conditional on a good policy environment in the recipient country. These results were somewhat disputed by Dalgaard and Hansen (2001), as their results show that it not is the aid effectiveness being conditional on the policy environment, but rather aid yielding diminishing returns as development takes place in the recipient country. Garces-Ozanne (2011) finds that aid in fact has a negative direct impact on economic growth, but positive effects on the national poverty gap and the prevalence of underweight children. For an excellent meta study on aid and growth, see Doucouliagos and Paldam (2006). Another strand in the AEL is concerned with aid allocation, where the findings suggest that donors oftentimes allocates aid along with their own interests – such as colonial past and strategic and political interests – rather than according to recipient needs or merits (Alesina & Dollar, 2000; Dreher, Nunnenkamp, & Thiele, 2011). Other studies contest this, as donors are shown to have the recipients' needs in mind when allocating aid (Neumayer, 2005).

There have been several attempts from the international community at making the effectiveness and quality of aid more easily assessable. At the first forum on aid effectiveness, the participants created the Rome Declaration of 2003, where public commitments were made by both donors and recipients of aid to make aid better targeted, better coordinated, and the decisions more informed (Palagashvili, 2019). In 2005, the members of the development community met again, to make a more detailed plan on aid effectiveness, namely the Paris Declaration on Aid Effectiveness. The hopes were high for the Paris declaration, 'because it created an implementation plan, set with clear indicators, measurement criterion, and targets set for specific years for both donors and recipients' (Palagashvili, 2019, p. 86). Three years later, the community met yet again, in Accra, Ghana, and similar pledges were made. The fourth forum was held in Busan, Korea, in 2011, where the development community yet again acknowledged that the donors were facing challenges with keeping their previous commitments, after which new commitments were made (Palagashvili, 2019).

During the last decade, the performance of the international aid community has been scrutinised by several scholars and researchers, and thus the AAPL has become a separate branch of the AEL. A large part of the literature ranks the donors along the lines of the Paris Declaration of 2005, where five principles of best aid practices were chiselled out: ownership, alignment, harmonisation, managing for results, and mutual accountability (Palagashvili, 2019, pp. 87-88). The ownership principle states that the aid recipients should themselves be the decision makers when planning for development and in the use of aid money; the alignment

principle states that donor agencies should base their support on the recipients' strategies; the harmonisation principle states that donors' actions should be transparent and collectively effective; the managing for results principle means that donors should manage their resources to achieve results; and the principle of mutual accountability states that both donors and recipients are accountable for development results. So far, the AAPL's findings are as sobering as the reports from the forums. Donors overall are not successful in meeting the best aid practises (Birdsall, Kharas, Mahgoub, & Perakis, 2010; Easterly & Pfutze, 2008; Easterly & Williamson, 2011; Knack, Rogers, & Eubank, 2011), and the bilateral donors seem to be the worst performing group (Palagashvili & Williamson, 2018).

Earlier research in the AEL has found some evidence suggesting that some of the bilateral donors are better performers than others. Therien and Noel (2000) find that the aid budgets of the Scandinavian countries (Denmark, Norway and Sweden) are larger in terms of spending per GDP than other donors, which also is confirmed by looking at the donor statistics from the OECD (OECD, 2020a). Alesina and Dollar (2000) find that the Scandinavian donors and Finland are targeting the poorest countries, and that they are rewarding good policies in the recipient country. Other studies have disputed these findings (Easterly & Williamson, 2011; Neumayer, 2003), finding no differences between the Nordic countries and the rest. With the inconclusive results of the previous research in mind, is there any reason to believe that Norway as a donor stands out from the other members of the Development Assistance Committee (DAC) of the OECD? This is one of the questions this thesis sets out to answer.

1.3 Thesis outline

The thesis is divided into six chapters. Chapter two lays out the theoretical framework for the research, and looks at the two main approaches to development aid, namely the aid optimists with scholars such as Jeffrey Sachs in the forefront, and the aid pessimists, with recent contributions from William Easterly and Dambisa Moyo. A part of the chapter is also dedicated to explaining the concept of sustainable development (SD), and its two sub-concepts *weak* and *strong* sustainability, and lastly, the hypotheses that lays the ground for the analysis and discussion. Chapter three presents the data and the methodical approach. Using data on official development aid (ODA) from the members of the Development Assistance Committee (DAC) of the OECD, this thesis looks for effects of aid on SD in the recipient countries. As SD is more a concept than it is hard, measurable facts, the effects of aid on SD are tried captured by using data on emissions and resource depletion in the recipient countries as proxies for sustainability. In chapter four, the analyses and results are presented. Previous research has found that donors

not always are acting solely in the interest of the recipient countries but are instead oftentimes found to allocate aid according to self-interest. By using the Heckman selection model, possible selection bias in Norwegian aid allocation is accounted for. In chapter five, the results are discussed in light of the theoretical framework and hypotheses. Chapter six provides some concluding remarks and suggests further research.

2 Theoretical framework

2.1 Development and development aid

The differences in living standard across countries in today's world are incredibly large; even after adjusting for purchasing power parity, the citizens in the world's richest countries are roughly 50 times richer than the citizens in the world's poorest countries (Arndt, Jones, & Tarp, 2014). Arguably, it is necessary to do something about this situation. However, the central question is what there is to do? In September 1994, the United Nations (UN) coordinated an international conference on population and development, known as the Cairo Conference, where 179 UN member states concluded that 'human beings should be the focus of efforts promoting social and economic development' (United Nations, 2020a). Six years later, all 191 UN member states adopted the Millennium Development Goals (MDGs). There were eight goals, which the member states committed to help achieving by the year 2015. The rich countries agreed to give 0.7% of their gross national income (GNI) as official development assistance, as they repeatedly had done before. In 2015, the Sustainable Development Goals (SDGs) replaced the MDGs, which set new targets for world development to be achieved within 2030. How these goals are to be achieved is a different story. As Sachs (2005, p. 222) puts it, 'the United Nations system is much better at articulating goals than actually fulfilling them.'

Figure 1. The MDGs (United Nations, 2020d)

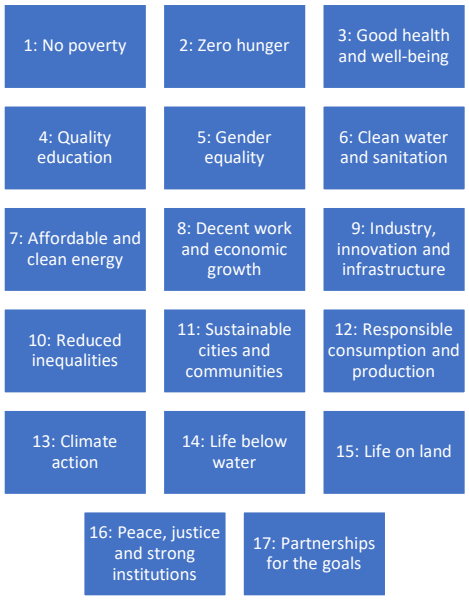

Figure 2. The SDGs (United Nations, 2020b)

One of the main tools rich countries use to promote development in the poor countries is development aid. Rich countries providing resources to poor countries for them to be able to

develop and prosper is not new. The Bretton Woods Agreement of 1944 can be seen as the starting point of the era of modern development aid, and the following Marshall Plan with the (successful) rebuilding of a war-torn Europe in the 1950s has become the benchmark for modern development aid. As Moyo (rhetorically) puts it: 'if aid worked in Europe, if it gave to Europe what Europe needed, why couldn't it do the same everywhere else?' (2009, p. 13).

Aid comes in many different shapes and forms, but the most important type in terms of size and influence is official development assistance (ODA) (Arndt et al., 2014). The definition of ODA is provided by the Development Assistance Committee (DAC) of the OECD and is reported in chapter 3.2.2. It is notable that ODA consists of both grants and loans from donors to recipients, thus development assistance is not always free money from one state to another. Aid often comes with ties, either in the form of requiring political or economic reforms the recipient country, or funds being earmarked for specific purposes, and even specific suppliers of goods or services (Arndt et al., 2014). For example, in 2005 the US pledged US$15 billion over five years to fight AIDS, but two thirds of the money were earmarked to go to pro-abstinence programmes, and 'would not be available to any organizations with clinics that offered abortion services or even counselling' (Moyo, 2009, p. 7).

During the last two decades, the debate about whether development assistance is fruitful or not has been one of the hottest topics in the field of development research. In 2001, when ex-World Bank employee, now New York University professor, William Easterly wrote The Elusive Quest for Growth (2001) he sparked the debate that is still going on today. Easterly addressed in his book, among other topics, the lack of economic growth and other improvements in long-term aid recipient countries, and concluded that development assistance as it is being provided today never will be the solution to the problems of the poor. Four years later, Jeffrey Sachs argued in his The End of Poverty (2005) that development assistance can be *the* solution to the problems of the poor, as long as the assistance is plentiful and carefully planned. The book became a New York Times best seller and paved the path for development aid to become common knowledge. The year after, Easterly responded with a book solely about development assistance, The White Man's Burden (2006b), in which he sets out to pick apart Sachs' arguments about aid and aid effectiveness. In the following, I will go through the arguments for and against aid, mainly focusing on the contributions of Easterly and Sachs.

2.2 Aid optimism

One of the most vocal, and most recognised, proponents of development assistance, Jeffrey Sachs, has for long been one of the leading voices in the aid effectiveness-debate. In his point

of view, development in the least developed countries (LDCs) is depending on outside help, as the one of the key obstacles hindering growth and prosperity is that they simply cannot afford to develop. Not only financial support is needed, but also trade reforms in the rich countries, debt cancellation, and peacekeeping support in the region in which the country is situated. In Sachs' words, 'the poor face structural challenges that keep them from getting even their first foot on the ladder of development' (2005, p. 226).

Sachs' critics may argue that in spite of the unrivalled flow of money and assistance from the rich to the poor during the last 60 or so years, the poor are still poor, and growth and prosperity is for many still but a faint dream. And while this may be true in some cases, or to some extent, Sachs' argument is that the assistance that we have seen so far not is enough. As an example, Sachs notes that when the United States Agency for International Development (USAID) launched its West African Water Initiative in 2002, their contribution was US$4.4 million over three years. 'If West Africa had a population of some 250 million people, $4.4 million over three years would be *less than a penny per person per year* [emphasis in original], enough perhaps to buy a Dixie cup, but probably not enough to fill it with water!' (Sachs, 2005, pp. 266-267). Even though the international community has provided more than US$2.6 trillion – approximately US$4.7 trillion in 2013 prices (Barder, 2014) – in aid since 1960, it is not enough. The arguments of Sachs are reminiscent to those of Rosenstein-Rodan's *big push*.

2.2.1 The big push

Sachs arguments can be traced back to Rosenstein-Rodan (1943, 1961) and his theory of the 'big push' that is needed to lift poor countries out of poverty. In short, this theory is grounded in the fact that there is an imbalance in the distribution of labour force and capital in the world; the developed countries have a surplus of capital but are in lack of labour force, and the less developed countries are lacking capital, but have large unutilised labour forces. The two obvious ways to resolve this imbalance is to either transport labour towards capital (emigration), or to transport capital towards labour (industrialisation) (Rosenstein-Rodan, 1943, p. 202). Industrialisation is for obvious reasons the easiest and most doable alternative of the two, and for the direction of capital towards developing countries to be effective, 'bit by bit' investments programmes are to be avoided because of the deficiency of social overhead capital (social overhead capital comprises the basic industries like power, transport and communications (Rosenstein-Rodan, 1961, p. 6)). Piecemeal investments will thus have little effect in developing countries, as the industrial infrastructure is not in place for the directly productive industries to grow 'on top of'. Instead, a 'big push' is needed to '"jump" over the economic

obstacles to development' (Rosenstein-Rodan, 1961, p. 14). Sachs (2005) argues that there are many barriers to overcome to promote prosperity, and that these barriers must be dealt with 'systematically, diligently, and jointly' (2005, p. 208) as solving one problem will affect how effectively other problems are solved. He thus agrees to the overall presumption that a big push is needed to lift the poor out of poverty, but him and other modern day proponents of development aid are not of the opinion that smaller aid flows are a waste of resources; small amounts of aid is not enough to completely alleviate the poor of their problems, but some is still better than nothing.

2.2.2 Assistance planning

Aid should not only be plentiful, it should also be allocated with precision, according to Sachs. In his view, development economics needs to be changed from today's 'one size fits all'-approach, to be more like modern clinical medicine in the sense that each country's challenges should be approached with a precise diagnosis and an appropriate treatment. To paraphrase Sachs (2005), every child with a fever does not have meningitis, and it would be silly to provide every feverish child the same treatment. Aid should be carefully planned, as the principle of managing for results stated in the Paris Declaration of 2005 also highlights.

All in all, Sachs', the World Bank, the International Monetary Fund, and other proponents of aid make a straightforward argument that providing economical support to states in lack of finances will lead to them having the recourses, and thereby the possibilities, to grow; and economic growth promotes growth in other areas. As Rosenstein-Rodan (1961) states, simple actuarial rules tells us that by investing in developing countries, the risks of further investments declines, leading to further investments and further growth, as the snowball starts rolling. And it is a compelling point; as Barder (2014) highlights, even if you assume that the *only* achievement of aid is the eradication of smallpox and the lives consequently saved – that all the money spent on aid since 1960 had gone into the eradication of smallpox –, the cost per death averted has been less than half the cost of what the National Institute for Health and Clinical Excellence in the UK regards a 'good value for money' death aversion. It is noteworthy that aid only partly contributed to eradicating smallpox, but as the scope of aid is far wider than smallpox alone, the argument still stands.

2.3 Aid pessimism

More recently, the aid literature has become more sceptical to aid, and the results aid might produce. Mainly, the works of William Easterly (2001, 2006b, 2016) and Dambisa Moyo

(2009) have been in the forefront of highlighting the fruitless, or even harmful, qualities of aid. Both Easterly and Moyo make the argument that the way aid often comes with conditionalities and ties makes the aid less effective in promoting growth, partly because recipient states are being forced to implement regulations and reforms that they themselves did not necessarily want in the first place, and partly because of the amount of documenting and reporting made necessary by the donor agencies.

Easterly (2006b), following up on the theme of The Elusive Quest for Growth (2001), also highlights the point that the way development aid is organised today, there are hardly any incentives for the aid agencies to do a better job today than they did yesterday, as they are not held accountable for the results they produce, but merely the effort they put in. The dollar amount of aid flows is easier to measure than the growth it spurs or the number of lives it saves, and so it becomes more important that the donors keep to their agreed amount of 0.7 percent of national GNI, than whether the aid is spent wisely or not (Østerud, 2006).

The key opposing point between the aid optimists and pessimists is the approach to how growth takes place. Easterly (2006a, 2006b) argues that the 'planned' approach makes as little sense in aid giving as it does in market economics; one cannot simply make a grand plan for how growth shall happen. Instead, aid agencies should concentrate on finding 'particular interventions that work and keeping those interventions going' Easterly (2006a, p. 103) argues, and draws a parallel to the debate in the twentieth century about social reform, where Karl Popper argued for 'piecemeal democratic reform' as opposed to 'utopian social engineering'. Moyo (2009), in support of this view, argues that democracy and economic development takes time to evolve, and that the way the West has tried shoe-horning democracy and development policies into African developing countries only has led to them being worse off than without the Western interference. In the aid debate, Easterly (2006b) distinguishes between what he calls 'planners', represented by Sachs, the IMF and the World Bank, characterised by their top-down approach to aid and development in the developing countries; and 'searchers', whom he describes as taking a bottom-up approach to development, seeking out small cost-effective projects with large benefits to the society in which they take place, much like Popper's description of the piecemeal engineer in *The Poverty of Historicism* (Popper, 1957).

Another point made by Easterly (2006b, 2016) and Moyo (2009) is that corruption often comes as a side effect of aid; Moyo even notes that 'the point about corruption in Africa is not that it exists: the point is that aid is one of its greatest aides' (Moyo, 2009, p. 48), upon which she elaborates how aid money lets corrupt leaders stay in business, and how this leads to jobs disappearing and the spread of poverty. This is usually followed by donors providing even more

money, and so the 'vicious cycle of aid' (2009, p. 49) keeps the recipient countries in a downward spiral of poverty. As aid recipients become dependent on aid, the aid inflows may lead to effects similar of those of a Dutch disease of natural resources, because states with a secure source of income – be it natural resources or development aid – shift their resources away from sectors of the economy that have positive externalities for growth, and because of the over-appreciation of the real exchange rate. It is argued that development is dependent on sound institutions (see for example Acemoglu & Robinson, 2012), thus pumping money into a state without a solid institutional framework will do no good.

2.4 Sustainable development

Because the concept of *sustainable development* is central to this thesis, we need to understand its content. The term was coined in the 1987 report Our Common Future (commonly known as the Brundtland report, named after the head of commission Gro Harlem Brundtland (Jarvie, 2020)), a report written by the World Commission on Environment and Development on appointment by the UN Secretary-General Javier Pérez de Cuéllar. A quick search in the citation database Scopus on '"sustainable development"' (with quotation marks) shows that the term was used between 11 and 50 times annually from 1985 to 1988 across all research fields, and from 1989 onwards the use increases every year, from 106 in 1989 to 23,704 in 2019, and is now commonly thought to be the 'international community's most urgent priority' (United Nations, 2020c).

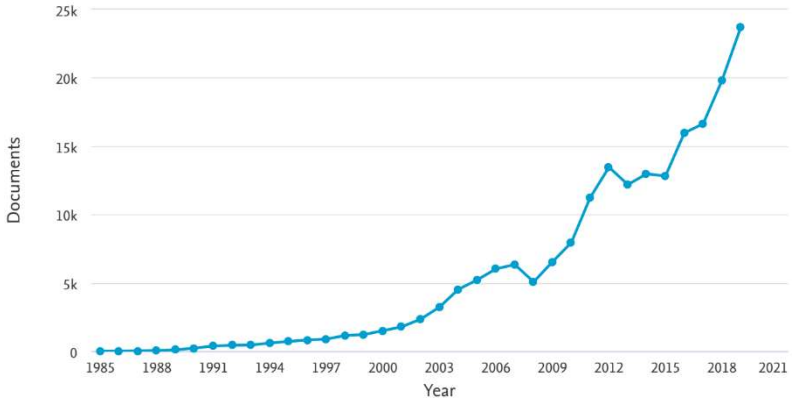

Figure 3. Scopus analysis of documents mentioning "sustainable development" annually, 1985–2019

The Brundtland-report's definition of sustainable development, namely making 'development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development, 1987, para. 27), was for long *the* definition (Rees & Smith, 1998), but as sustainable development has grown to become an integral part of nearly all human activity, the definition has somewhat broadened. Sustainable development is today seen being based on the three pillars of sustainability: the environmental, the social, and the economical pillar. Sustainable development can be achieved when these pillars are balanced (Lydgate, 2012), in

the sense that e.g. economic development is not taking place at the expense of preserving the environment, or, on the other hand, that environmental concerns are prioritised so that economic development is inhibited too much. As the Brundtland-report (1987, ch. 2, para. 12) phrases it:

> As for non-renewable resources, like fossil fuels and minerals, their use reduces the stock available for future generations. But this does not mean that such resources should not be used. […] Sustainable development requires that the rate of depletion of non renewable resources should foreclose as few future options as possible.

In other words, the use of fossil fuels and the emission of greenhouse gases is not to be completely avoided, but the extent of the use and emissions should be limited.

2.4.1 'Weak' and 'strong' sustainability

The argumentation above indicates that there should exist a threshold for when an economy goes from being sustainable to being non-sustainable, as pollution and use of non-renewable resources should not exceed a 'sustainable level'. Sustainable development is arguably a fluid concept and deducing a mathematical threshold for when an economy is sustainable and when it is not is a task too ambitious for this thesis. Instead, drawing upon one of the great sustainability debates, this thesis uses the concepts of 'weak' and 'strong' sustainability (Atkinson, Dietz, Neumayer, & Agarwala, 2014) to analyse the level of sustainable development in aid recipient countries. Strong sustainability is sustainability without care for economical or other development, where human actions should be constrained 'at whatever cost' to protect the critical forms of natural capital, whereas weak sustainability is only keeping the real value of society's total asset portfolio constant, without any special care taken for the environment or the other constituent parts (Atkinson et al., 2014, p. 3). In short, the difference between the two is that where strong sustainability states that any development at the expense of the environment, such as the extraction and use of non-renewable natural capital or pollution emissions, is to be considered non-sustainable, weak sustainability considers development to be sustainable as long as the total portfolio of wealth left for future generations is equal to or greater than what it would have been without the environmental sacrifices. A country being dependent solely on non-renewable natural capital is not sustainable, but are the resource rents used to invest in other productive assets, with the natural resources providing a 'one-time chance' (Lange, Wodon, & Carey, 2018, p. 13) to finance development, this is to be considered weakly sustainable.

To measure the impacts of development aid on weak sustainability, this thesis uses the ratio of resource depletion to the remaining lifetime reserve measured as a percentage of a

country's GNI (see a detailed description in chapter 3.2.1). A much used measure of weak sustainability in the literature is the World Bank's 'Adjusted Net Savings' (de Soysa & Neumayer, 2005; Hess, 2010; Qasim & Grimes, 2018), wherein the resource depletion ratios are a part of the equation. Under the assumption that the larger a country's share of GNI directly stems from depletion of non-renewable natural resources, the more dependent the country's economy is on natural resource rents, analysing only the impacts on resource depletion ratios measured as a percentage of a country's GNI arguably is a more precise measure of weak sustainability in fixed effects time series analysis. A growing share of natural resource depletion ratio of GNI becomes a direct measure of a country's increasing dependency on its natural resources, whereas a shrinking share indicates the opposite (see Lange et al., 2018, p. 223 for the Adjusted Net Savings equation). Sustainability can, on the other hand, only be considered strong when environmental harm is avoided, without regards to the wealth or well-being produced. Thus, this thesis uses environmental harm measured in absolute terms – CO_2 and greenhouse gas emissions per capita – as the dependent measures to capture the impact of development aid on strong sustainability.

2.4.2 Consequences of non-sustainability

> Total GHG [greenhouse gas] emissions, including from land-use change, reached a record high of 55.3 GtCO2e in 2018. There is no sign of GHG emissions peaking in the next few years; every year of postponed peaking means that deeper and faster cuts will be required. By 2030, emissions would need to be 25 per cent and 55 per cent lower than in 2018 to put the world on the least-cost pathway to limiting global warming to below 2°C and 1.5°C respectively (United Nations Environment Program, 2019).

In a world where this citation is repeated time and time again, the green political parties are gaining traction in several countries, and children and adults alike are marching and protesting for climate action, one would think that Mother Earth was about to get some rest from the use and abuse humankind is putting her through. At the same time, environmental politics is a divisive topic, which is shown by the rise in populistic political parties and leaders throughout the world rebelling against the so-called establishment elites, accusing them of forcing the 'climate hoax' (Worland, 2019) onto Joe the taxpayer. Environmental politics is in fact becoming a dividing line between political blocks (Inglehart & Norris, 2016). A problem one must deal with when trying to tackle environmental changes is the complexity of the matter, as environmental politics not only is about the environment, but also encompasses economy and society, future generations, and poverty. Thus, there is no 'quick fix' to the problem. The effects of climate change are hurting the world's most vulnerable the hardest, with droughts, extreme

weather, and food and water shortage as some of the key risk factors, and can act as a catalyst for turmoil and war, in addition to creating development aid dependency (Mercy Corps, 2019). Thus, mitigating climate change and promoting sustainable development is critical to aid the development of the world's poor.

The needs of poverty alleviation and environmental protection have 'long been recognized as complementary challenges' (Eyckmans, Fankhauser, & Kverndokk, 2016, p. 430), as reducing poverty goes hand in hand with growing industrialisation and reducing the number of people living hand to mouth – which essentially are the most environmentally friendly people on the globe. Since 1998, the DAC has monitored aid targeting climate change mitigation (OECD, 2011), thereby suggesting that the two goals of poverty alleviation and environmental protection have coexisted for at least 20 years. The DAC classifies a development aid activity as climate-change-mitigation related if it 'contributes to stabilising the greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system' (OECD, 2011, p. 4). Such activities are largely related to the transport, industry and agricultural sectors (modernising and improving equipment and machines); to the waste management and sewage sectors (improving filtering and treatment technologies), and to the forest sector (developing the forest management, reducing deforestation and forest depletion) (OECD, 2011).

A more indirect effect development aid may have on the sustainable development of the aid recipients goes through the resource curse. This is a well-documented challenge faced by countries rich in non-renewable resources (Dietz, Neumayer, & De Soysa, 2007; Lange et al., 2018). In short, the resource curse describes the phenomenon of fuel and mineral rich countries experiencing slower – or even negative – growth than countries without the nature given gifts of natural resources. The paradoxical relationship between natural resources and poor economic growth has several explanations, but the main one being that without the need to diversify the economy and invest in future growth, resource-abundant countries simply lack the incentives to do so. In addition, resource rents may give rise to corruption, which in turn slows the economy even further (see Dietz et al., 2007 for an excellent review of the mechanisms behind the resource curse). Development aid inflows to their economies could in theory make developing countries less dependent on depleting their resources, thereby both contributing to economic growth and reduced natural resource depletion.

2.5 Hypotheses

It is arguable whether one should expect development aid to produce wanted results or not. Considering the discussions in chapters 2.2 and 2.3, combined with the mixed results from the previous research, it is hard to predict whether development aid should be expected to produce results. As previous research has found Norway to be among the 'better' donors (Alesina & Dollar, 2000), and because of the assumption that Norway – wanting to expand the perception of Norway to not only be a 'peace nation', but also an advocate for sustainable development across the globe – is eager to substantiate its position as an 'environmental superpower' (Jørgensen, 2011, p. 99), I expect my findings to show differences between the effects of Norwegian aid and those of the other DAC members. Jeffrey Sachs and the other proponents of aid in great numbers make compelling arguments; after all, simple reasoning suggests that if capital is transferred to the capital poor, labour rich areas of the world, development should be bound to take place. But, as the aid pessimists argue, if it in fact is so easy, why have we not yet seen strong evidence for the effects of development assistance? After all, capital transfers from the rich to the poor is no new idea, and yet, the evidence speaking *against* development aid is at least as common as the opposite. Thus, I do not expect to find any convincing evidence for aids positive effects on sustainable development, and my first hypothesis can be expressed:

H_1: ODA from the DAC donors other than Norway has no effects on weak nor strong sustainability of the recipient's development, cet. par.

In chapter 1.1, I argue that Norway's foreign policy is characterised by a duality between idealpolitik and realpolitik, and that Norway is acting according to its idealpolitik to achieve realpolitikal goals. In the context of the 'rhetoric versus reality' debate, one can draw lines between idealpolitik and rhetoric on the one hand, and realpolitik and practice on the other. Not only attempting to gain international recognition, but also to strengthen the candidacy for a seat in the UN Security Council, Norway is highlighting its efforts regarding sustainable development, and has been doing so more or less since sustainable development became a topic of concern. Fulfilling its international commitments through seemingly idealpolitikal actions is one of Norway's best bets to achieve realpolitikal goals, such as international recognition and strengthened ties to its allies. Given that development aid is being more scrutinised today than before, it is reasonable to expect Norwegian aid and foreign policy makers to be aware of the fact that they are being held accountable for the results its development aid produces. This is of course true for every other aid agency as well, but under the assumption that being perceived

as a dependable ally[1] and a strong contributor to the international community is a key part of Norway's foreign policy, I expect the Norwegian emphasis on development aid results to be stronger than those for the other donors. Even though the findings in both the aid effectiveness literature and the aid agency performance literature are inconclusive regarding the performance of Norway and Scandinavia as donors, I am expecting to find differences between Norwegian ODA and ODA from the other DAC members. My second hypothesis is thus:

H_2: Norwegian ODA has positive effects on both strong and weak sustainable development in the recipient countries compared with other DAC donors, cet. par.

[1] See for example NOU 2016: 8 (2016), concluding that Norway's civilian and military involvement in Afghanistan during the 2001-2014 period was mainly driven by Norway wanting to be a 'good ally'.

3 Data and methods

This study uses time-series, cross-sectional (TSCS) data for roughly 135 countries for the 1989–2018 period. The period after the end of the Cold War is used to avoid mixing the highly politicised strategic aid due to the competition between East and West. Moreover, sustainability became a mainstream issue only since the late 1980s, as demonstrated in Figure 3. Nevertheless, the data cover each country for each year during this time-period, with gaps for some countries, thus making the dataset unbalanced. The dependent variables are continuous measures, hence standard OLS regression can be used to estimate the models. TSCS data typically suffer from autocorrelation and heteroscedasticity (Beck & Katz, 1995). The autocorrelation assumption is confirmed by Wooldridge test for first-order serial correlation. Therefore, I use the Driscoll-Kraay standard errors in the pooled OLS analyses because these standard errors are robust to autocorrelation, heteroscedasticity, and spatial dependence when data clusters in space. TSCS data are also sensitive to possible unit heterogeneity (Wilson & Butler, 2007), and using country fixed effects gives the net effect of aid flows after assessing all the unmeasured fixed factors unique to the individual countries, such as colonial history, culture, beliefs, and geographic factors. The countries in Western Europe, North America, and Oceania, as well as Japan are omitted from the analyses, as these countries are the industrialised democracies that make up the DAC donor community.

3.1 The Heckman method

ODA donors may be biased in their selection of aid recipients. Given that donors may want their aid to appear as helpful and effective as possible, donors may want to avoid the worst performing countries and rather allocate their aid funds towards better performers, as the impact of aid is more likely to be positive in countries that are already developing positively. As discussed earlier, aid effectiveness has become a highly researched topic by economists and social scientist. This, and the fact that there are semiregular forums on aid effectiveness, where the results of, and allocation mechanisms behind, aid is discussed and shed light upon, aid donors are likely wanting their aid to seem as effective as possible to gain recognition from the international society. With chapter 1.1 in mind, this is also likely to be true for Norway as an aid donor. At a minimum, aid allocation is not a completely randomised process; therefore, the analyses are also done using Heckman's selection model (Heckman, 1979). This approach assumes that the data sample is not randomly chosen and tries to correct this mathematically. There are two stages in the Heckman method. The first stage is a probit model for selection, which models the probability of receiving Norwegian ODA based on carefully chosen variables

that are thought to influence the probability. This is done to calculate the Inverse Mills Ratio (IMR), which in the second stage is inserted into the initial regression model to assess for, and attempt to control for, selection bias. Note that the analyses are done using the *twostep* option[2], as the dataset is too large to run the Heckman command with maximum likelihood estimation of the parameters (without the *twostep* option). The only notable drawback to this is that the option of Huber-White standard errors robust to heteroscedasticity is not available together with the twostep option. Otherwise, the model with the twostep option produce similar results.

In stage one I assume the probability of a recipient country *i* receiving ODA from Norway in year *t* as a function of several factors. To model this, a dummy variable is made from the Norwegian aid-variable and is given the value 1 when country *i* in year *t* has received aid from Norway, and 0 otherwise. First, I assume that Norwegian aid flows follow the aid flows from other DAC donors, as aid projects often are financed by multiple donors (see for example Easterly & Williamson, 2011), thus Norwegian aid flows being dependent on aid flows from the other DAC member countries to country *i* in year *t*. Second, as the analyses of Easterly and Williamson (2011), and the statistics from OECD (2017) shows, I expect aid flows to be dependent on the wealth of the recipient country, meaning aid flows being dependent on GDP per capita in country *i* in year *t*. Third, the population size of the recipient country has also been demonstrated to impact the aid flows, as countries with smaller populations receive less aid than those with larger populations (Alesina & Dollar, 2000; Easterly & Williamson, 2011), and I therefore expect aid flows to country *i* in year *t* being dependent on population size. Fourth, Norwegian aid has been shown to be allocated to countries with higher levels of democracy, and as such, the aid flows are expected to be dependent on the recipient country *i*'s score on the Electoral democracy index. Last, countries in a state of civil war are more likely to receive humanitarian aid than development aid, and as humanitarian aid does not count towards ODA flows, the probability of countries in the state of civil war receiving development aid is expected to be lower than for those not experiencing civil war. In step two, the IMR is inserted into the OLS model to account for the selection bias estimated in step one

3.2 Main variables

3.2.1 Dependent variables

The Brundtland report explicitly states that the depletion of natural resources is not unsustainable per se, as long as the rate of depletion 'foreclose as few future options as possible'

[2] In STATA version MP 16.1

(World Commission on Environment and Development, 1987, ch. 2, para. 12). The economic growth extraction of non-renewable resources, such as fossil fuels and minerals, can bolster is enormous – some of the richest countries in the world have economies largely driven by natural resources – making depletion of non-renewable resources a potentially very effective path to economic development. But from a sustainability point of view, the rate of depletion must not be too rapid, both to ensure 'that the resource does not run out before acceptable substitutions are available' (World Commission on Environment and Development, 1987, ch. 2, para. 12), and that the natural systems that support life on Earth are not endangered (World Commission on Environment and Development, 1987, ch. 2, para. 9). Using the ratio of depletion of various natural resources as dependent measures of sustainability can thus be a somewhat double-edged sword. Development aid is to be a tool to assist poor countries develop, and one might argue that economic development trumps sustainability concerns, at least in the short run, implying that development aid may be used to assist developing countries use their natural resources to develop economically. As long as the societal gains from the resource depletion are greater than the loss of the depleted resources, this is to be considered weakly sustainable. As sustainability is one of the key concerns on the international agenda, and as a rapid depletion of natural resources is to be considered unsustainable, one should expect to see development aid being used to help developing countries become less reliant on the income from natural resource depletion, thus – under the assumption that aid is effective – aid is expected to decrease the ratio of resource depletion in the recipient country. Therefore, I use natural resource depletion as dependent variables to measure whether development aid promotes weak sustainable development. Data on natural resource depletion are readily available from the World Bank's World Development Indicators (WDI) (World Bank, 2020d).

This thesis mainly uses two measures on resource depletion: *mineral depletion ratio* as a percentage of GNI and *net forest depletion rate* as a percentage of. In addition, analyses done with the dependent variable measuring the sum of the mineral depletion ratio[3], the energy depletion ratio, and the net forest depletion rate is added in the Appendix as a robustness check. The mineral depletion variable measures the ratio of the value of the stock of mineral resources to the remaining reserve lifetime, and covers the minerals tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite (used in aluminium production), and phosphate. It measures the depletion as a percentage of the Gross National Income (GNI). The value of a nations stock of a non-renewable resource is measured as the present value of the stream of expected rents that may

[3] The energy depletion ratio covers oil, crude oil, and natural gas, and is calculated as the value of the stock of energy resources to the remaining reserve lifetime.

be extracted from the resource until it is exhausted (Lange et al., 2018, p. 212). To reduce the right skew the variable is suffering from, it is log transformed. The variable ranges from 0 to 23.29, hence 0.1 is added to the variable before transformation, as zero- or negative values cannot be log transformed (Mehmetoglu & Jakobsen, 2017). The net forest depletion variable measures the product of unit resource rents and the excess of roundwood harvest over natural growth as a percentage of GNI. If the extraction rates are higher than the natural growth rate, the variable measures the harvest-to-growth ratio. If growth exceeds harvest, this figure is zero (Lange et al., 2018, p. 222). It is worth noting that the variable does not measure deforestation, e.g. when forested land area is repurposed. To reduce the right skew the variable is log transformed after adding 0.1.

As strong sustainability is defined as sustainability without regards to economic or other development, measuring this requires real term measures of environmental harm. This thesis thus uses CO_2 and greenhouse gas emissions per capita to capture the effects of development aid on strong sustainability. Arguably, climate change is one of the greatest challenges the human species have ever faced (see for example Zaffalon, 2010), and the main anthropogenic factor is the release of greenhouse gases (Zaffalon, 2010, p. 34). This is also expressed thoroughly through the SDGs, i.e. with goal seven and 13 being 'Affordable and Clean Energy', and 'Climate Action', respectively (United Nations, 2020b). Therefore, both CO_2 emissions and greenhouse gas emissions are used as measures of sustainable development in this thesis. The CO_2 emissions variable is retrieved from the WDI, and is compiled by the Carbon Dioxide Information Analysis Center, based on data from the United Nations Statistics Division's World Energy Data Set on anthropogenic emissions from the burning of fossil fuels, and data from the U.S. Department of Interior's Geological Survey on the manufacture of cement. Emissions from land use are excluded. It measures CO_2 emissions in metric tons per capita, and ranges from -0.2 to 99.5. After adding 0.3 to all the variable's values to make all values larger than zero, the variable is log transformed to reduce right skew. Additionally, the same analyses are done with greenhouse gases as the dependent variable. This variable is also retrieved from the WDI (World Bank, 2020d). It measures the total amount of greenhouse gases in kilotons of CO_2 equivalent emitted. CO_2 emissions from short-cycle biomass burning (burning of agricultural waste and Savannah burning) is excluded, but CO_2 emissions from other biomass burning is included as well as from the burning of fossil fuels and the manufacture of cement, and all other anthropogenic methane (CH_4) and nitrous oxide (N_2O) sources are included, as are the F-gases (hydrofluorocarbons (HFCs, refrigeration gases), perfluorocarbons (PFCs, typically used in the electronics sector), and sulphur hexafluoride (SF_6, used mainly as an insulating gas, and in the

production of metals)). The variable measures total emissions in kilotons of CO_2 equivalents, and is therefore divided by population to make the values per capita figures, to account for the fact that larger countries will produce more pollution, and to make the results comparable to the CO_2 emissions variable.

3.2.2 Main independent variables

The main independent variables are *net bilateral aid flows*, namely 'net disbursements of official development assistance (ODA) or official aid from the members of the Development Assistance Committee (DAC)' (World Bank, 2020b). The definition of ODA is provided by the DAC. Up until 2017, the definition of ODA was the sum of loans and grants going to countries and territories on the DAC list of ODA recipients and to multilateral institutions which are provided by official agencies, including state and local governments, and (a) is administered with the promotion of the economic development and welfare of developing countries as its main objective, and (b) conveys a grant element of at least 25 percent (OECD, 2020b). From 2018 onwards the requirements regarding the grant element changed, with the new definition requiring the grant element to be 45 percent in the case of bilateral loans to the official sector of Least Developed Countries (LDCs) and Low Income Countries (LICs), 15 percent in the case of bilateral loans to the official sector of Low and Middle Income Countries (LMICs), 10 percent in the case of bilateral loans to the official sector of Upper Middle Income Countries (UMICs), and 10 percent in the case of loans to multilateral institutions (OECD, 2020b). To be counted as ODA, loans must also be consistent with the International Monetary Fund's (IMF) Debt Limit Policy and/or the World Bank's Non-Concessional Borrowing Policy.

The World Bank provides data both on individual donor countries, as well as aggregated DAC member countries[4]. All the analyses are done with Norwegian ODA flows and total DAC ODA flows as the main independent variables. This way, the coefficients for the Norwegian ODA will show the impact of Norwegian aid, and the coefficients for the total DAC ODA will show the impact of total DAC aid, controlled for the impact of Norwegian aid, thereby measuring the impact of DAC minus Norwegian aid flows. The values of both ODA variables are in current US$, and are divided by population and multiplied by 1,000, to make them per 1,000 capita. The DAC aid per 1,000 capita variable ranges from -52,036.3 to 818,214.8 and suffers from right skewedness. Thus, it is log transformed, after adding 52,037 to make all

[4] The DAC member countries are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, The Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States, and European Union Institutions.

values greater than zero. The Norwegian aid per 1,000 capita variable ranges from -3,233.954 to 120,935.8 and is also suffering from right skewedness, and is therefore also log transformed, after adding 3,234 to make all values greater than zero.

3.2.3 Control variables

It is important to control for several relevant factors that may be associated with both sustainable development and the amount of aid a country can expect to receive. Firstly, I control for population size, as the size of the country could explain some of the institutional differences between the countries. Previous findings in the aid effectiveness literature also shows that smaller countries receive more aid per capita (see for example Alesina & Dollar, 2000), known as the 'small country bias' (Easterly & Williamson, 2011, p. 1932), and controlling for this effect will uncover the potential effect on the dependent variable through the independent variables, that is ODA. The variable counts all residents regardless of legal status and citizenship, with the values being midyear estimates. The variable ranges from 41,700 to 1,390,000,000, and is log transformed to reduce its right skew.

Secondly, I control for per capita GDP because on the one hand, wealthier countries should be seen to receive less aid, and on the other, the wealth of a country can be thought to influence both the country's natural resource depletion rate and its pollution emissions. For example, Zaman and Moemen (2017) find evidence for an inverted U-shaped relationship between CO_2 emissions and per capita income; that is emissions increase in the early stages of development, while at later stages, the emissions decrease significantly. This is known as the Environmental Kuznets Curve (Eriksson & Persson, 2013; Zaman & Moemen, 2017). The variable measures GDP per capita in constant 2010 US$, and ranges from 132.3032 to 116,232.8. It is log transformed to reduce skewness. The variable is retrieved from the WDI (World Bank, 2020d).

Thirdly, democracies are more likely to have mechanisms in place to hold the public sector accountable to the people, thus making it more likely that i.e. regulations regarding pollution emissions both in fact exists, and that such regulations are being enforced. Eriksson and Persson (2013) find some evidence that the relationship between democracy and pollution is negative, and Policardo (2016) shows that states transitioning from autocracy to democracy are polluting significantly less once the transition has taken place. Additionally, the Environmental Kuznets Curve may also be captured by the level of democracy. On the other hand, the level of democracy may also affect the aid flows. As previously noted, some argue that development aid should go to those needing it the most, thus aid should be allocated

towards poorly governed regimes to boost the democratisation process (Sachs, 2005). Others, on the other hand, argue that sound institutions should be in place before development assistance is granted, or else the money will only be fostering corruption in an already corrupt society (Easterly, 2006b; Moyo, 2009). Kosack (2003), using several different measures, finds that development aid has positive effects on quality of life in democracies, and at best no effects in autocracies. Thus, I include democracy as a control in my analyses, as regime type may affect the dependent variables both with direct effects, and through the aid variables. There are several measures of democracy, with the three most prominent datasets being PolityIV, Freedom House, and Varieties of Democracy (V-Dem) (Boese, 2019). I will not delve into a discussion about the differences between these due to the scope of this thesis (see Boese (2019) for a detailed comparison), but simply state that the measure for democracy used here is the Electoral democracy index from the V-Dem dataset. It measures 'to what extent […] the ideal of electoral democracy in its fullest sense [is] achieved' (Coppedge et al., 2020, p. 42), and measures this based on five indices (freedom of association, clean elections, freedom of expression, elected officials, and suffrage), giving each country a score from zero to one each year.

Fourthly, I control for the history of peace and ongoing civil war, as being in a state of civil war likely will disrupt the development in a country – sustainable or not – and the aid going to countries during a civil war most likely is more humanitarian than developmental, and thereby not in the scope of this thesis. As Li and Wen (2005) show, armed conflicts have lingering effects on the population in a post-war country, and the aid going to post-war countries also differs from non-war development aid (Fearon, Humphreys, & Weinstein, 2009). Therefore, both ongoing civil war and the history of peace are likely to be relevant controls. The Uppsala Conflict Data Project (UCDP) identifies armed conflicts between a state and an organised rebel group with at least 25 battle-related deaths in a year (Gleditsch, Wallensteen, Eriksson, Sollenberg, & Strand, 2002), and using their type of conflict variable, a civil war dummy variable is created, giving countries the value 1 in year *t* if the country is experiencing a civil war with at least 25 battle-related deaths in year *t*, and 0 otherwise. The history of peace variable simply counts the number of years since a country last experienced a conflict, and resets if the country enters a conflict once again.

4 Results and analyses

The following chapter presents the analyses. First, the results from the analyses of the impact of ODA on weak sustainability estimated with ordinary OLS with fixed effects and Driscoll-Kraay standard errors are presented, followed by analyses of the same variables estimated with the Heckman two-step model, to examine whether the results change after controlling for the possible selection bias in Norwegian ODA allocation. Second, the results from the analyses of the impact of ODA on strong sustainability are presented, following the same approach as described above.

4.1 Aid and weak sustainability

Table 1 shows the results from the analyses of Norwegian and DAC ODA on the measures of weak sustainability, namely mineral depletion ratio and net forest depletion ratio, estimated with OLS with time and country fixed effects and Driscoll-Kraay standard errors. Except for in column 4, neither Norwegian ODA nor ODA from the other DAC members show any effects on weak sustainability. Columns 1, 2 and 3 show the analysis with the mineral depletion ratio as a percentage of GNI as the dependent variable. As seen, there are no significant effects of ODA on the mineral depletion ratio, suggesting that the economies of aid recipient countries dependency on depleting their mineral resources are not affected by ODA flows. Moving on to the control variables, population is seen to have a strong positive and significant effect on the mineral depletion ratio. As these are fixed effects analyses, the effects captured are the within effects, meaning that the positive and significant population coefficient suggests that the depletion ratio contributes to a greater share of a country's GNI as the country's population is increasing (as opposed to a random effects/between effects analysis, where a similar coefficient would indicate that higher populated countries would have a larger share of their GNI coming from the mineral depletion ratio). The effect of the population size remains positive and highly significant even after adding all controls to the model. Moving on, the wealth of a country, measured by GDP per capita, does not have any effects on the mineral depletion ratio, meaning that the share of GNI constituted by the mineral depletion ratio does not significantly change if the country's GDP per capita changes. Democracy, measured by the V-Dem Electoral democracy index, on the other hand shows significant positive effects on the mineral depletion ratio. As mentioned in the previous chapter, a theoretically expected relationship between development and environmental harm is for it to take on the shape of an inverted U (the Kuznets Curve), such that environmental harm will increase during the early stages of development, at some point plateau, and then decrease with further development. However, adding a quadratic

function of the democracy variable to the mineral depletion ratio model does not support this assumption (see Table 7 in Appendix A), as this only results in the significant effects of both the linear and the curvilinear relationship between democracy and the mineral depletion ratio to disappear. Therefore, it seems that as countries become more democratic, the mineral depletion ratio share of GNI increases, thus indicating that democratic development contributes to increased dependency on mineral resource depletion, and thereby lessened weak sustainability. There are no observable effects of civil war on the mineral depletion ratio, meaning that being in a state of civil war with at least 25 battle related deaths in year *t-1* does not affect the dependency on mineral resource depletion in year *t*. Peace history does on the other hand show a positive highly significant effect, suggesting that the mineral depletion ratio share of GNI increases with time since the last conflict.

Columns 4, 5 and 6 show the results from the analyses using net forest depletion as the dependent variable. There are no observable effects of Norwegian ODA across the models, but ODA from the other DAC donors shows a small positive effect on forest depletion in column 4, statistically significant with a 90 percent confidence level. However, this effect disappears after adding the controls to the model, which indicates that ODA has no effects on weak sustainability in the aid recipient countries. Turning to the control variables, population shows no significant effects on the GNI share of net forest depletion, meaning that economic dependency on forest depletion is independent of the population size. Wealth, on the other hand, shows a negative highly significant effect, indicating that the richer – in terms of GDP per capita – a country becomes, the less forest depletion relatively contributes to the GNI of the country. As the forest depletion variable measures the value of excess of roundwood harvest over natural growth, this may be explained by poor countries not having the resources to keep up sustainable forest industries and thereby harvest more than is regrown, and as the country becomes wealthier more resources can be invested into future earnings – re-growing forests that is – which would explain the observed relationship. Moving on to the war related controls, civil war shows a positive significant effect on net forest depletion, which can be interpreted as supportive of the previous argument; immediately after a civil war, a country needs resources to rebuild and stabilise the economy, which leads to forest depletion making up a larger part of the country's GNI. Peace history shows no significant effects.

Table 1. The effects of ODA on weak sustainability, estimated using fixed effects and Driscoll-Kraay standard errors

VARIABLES	(1) Mineral depletion ratio (% GNI) (log)	(2) Mineral depletion ratio (% GNI) (log)	(3) Mineral depletion ratio (% GNI) (log)	VARIABLES	(4) Net forest depletion rate (% GNI) (log)	(5) Net forest depletion rate (% GNI) (log)	(6) Net forest depletion rate (% GNI) (log)
Norwegian ODA (log) $_{t-1}$	-0.00642	-0.00882	0.00732	Norwegian ODA (log) $_{t-1}$	0.00928	-0.0112	-0.0147
	(0.0229)	(0.0249)	(0.0240)		(0.0271)	(0.0264)	(0.0283)
DAC ODA (log) $_{t-1}$	-0.00154	0.00122	0.0278	DAC ODA (log) $_{t-1}$	0.0828*	0.0537	0.0559
	(0.0270)	(0.0270)	(0.0335)		(0.0455)	(0.0355)	(0.0371)
Population (log) $_{t-1}$		0.661***	0.806***	Population (log) $_{t-1}$		0.106	0.103
		(0.163)	(0.163)			(0.249)	(0.252)
GDP per capita (log) $_{t-1}$		-0.00140	-0.00223	GDP per capita (log) $_{t-1}$		-0.311***	-0.298***
		(0.0564)	(0.0538)			(0.0456)	(0.0443)
Electoral democracy index $_{t-1}$		0.188**	0.209**	Electoral democracy index $_{t-1}$		0.760***	0.790***
		(0.0830)	(0.0860)			(0.151)	(0.156)
Civil war $_{t-1}$			0.0603	Civil war $_{t-1}$			0.0825**
			(0.0521)				(0.0390)
Peace years			0.00607***	Peace years			-0.00126
			(0.00179)				(0.000937)
Constant	-	-	-15.05***	Constant	-1.971***	-1.046	-
	-	-	(2.588)		(0.557)	(4.188)	-
Observations	2,958	2,921	2,861	Observations	2,860	2,824	2,798
Number of groups	147	144	139	Number of groups	143	140	137

Driscoll-Kraay Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2 and 3 show the same analyses as Table 1, but estimated using the Heckman two-step method. In both Tables 2 and 3, the selection equation is presented first, followed by the fixed effects OLS estimation with selection bias control. With all but the civil war variable being significant in the selection equation, the chosen selection predictor variables are arguably capturing a Norwegian selection bias. As seen, the effects of DAC ODA, population size, and democracy are positive, meaning that receiving ODA from the other DAC donors, being a country with a larger population, and being a more democratic country increases the predicted probability of the country receiving ODA from Norway. GDP per capita is on the other hand negative, indicating that being a poor country increases the predicted probability of receiving Norwegian aid. These results are all as expected, except for the effect of population size; earlier research has shown that smaller countries are receive more aid than larger countries (Alesina & Dollar, 2000; Easterly & Williamson, 2011), and the negative impact population size has on Norwegian aid allocation is therefore a noteworthy result. The selection equation calculates the Inverse Mills Ratio (IMR), which is used in the OLS to account for the calculated selection bias, and the results shown in the regression estimations in Table 2 and 3 are the results after controlling for the measured selection bias. As seen in both Tables 2 and 3, the IMR becomes significant when adding the control variables (columns 2 and 3 in both tables), thus indicating that the measured selection bias indeed is affecting the results.

Turning to the results from the regression estimations, Table 2 shows the results from the analysis of the effects of Norwegian and DAC ODA on the mineral depletion ratio. The results are quite similar to those in Table 1, columns 1, 2 and 3. Aside from marginal differences between the measured effects, the only major difference is that whereas democracy is shown to have a positive relationship with the mineral depletion ratio in Table 1, no significant effects are seen in Table 2. Given that the selection equation only affects the Norwegian ODA variable, and that the estimations in Table 1 are done using Driscoll-Kraay standard errors, which arguably are better suited to CSTS analysis, the differing results will not be given much thought, as the estimations with Driscoll-Kraay standard errors arguably are more robust. Table 3 shows the results from the analysis of Norwegian and DAC ODA on net forest depletion, and here the results are noteworthily different. Whereas the aid from the other DAC members than Norway showed no significant effects on net forest depletion in Table 1, the results shown in Table 3 indicates that DAC aid actually increases net forest depletion in the recipient countries, statistically significant with a 99 percent confidence level. As for the previous table, this estimation is done with regular standard errors and are thereby not accounting for the issues in the data, namely serial correlation and heteroscedasticity. Therefore, while this result is an

interesting finding, I will not analyse it further, as the results from the analyses done with Driscoll-Kraay standard errors arguably are more robust. Other than this, there are no differences between the two model estimations.

Table 2. The effects of ODA on the mineral depletion ratio (% GNI). Estimated using the Heckman two-step model.

Selection equation

	(1)	(2)	(3)
VARIABLES	Norwegian ODA dummy	Norwegian ODA dummy	Norwegian ODA dummy
DAC ODA (log)	0.397***	0.397***	0.395***
	(0.0602)	(0.0602)	(0.0602)
GDP per capita (log)	-0.447***	-0.448***	-0.448***
	(0.0305)	(0.0306)	(0.0306)
Population (log)	0.449***	0.452***	0.451***
	(0.0249)	(0.0250)	(0.0250)
Electoral democracy index	0.579***	0.585***	0.583***
	(0.131)	(0.132)	(0.132)
Civil war	-0.0542	-0.0623	-0.0612
	(0.100)	(0.100)	(0.100)
IMR	0.117	0.337**	0.322**
	(0.159)	(0.163)	(0.164)
Constant	-7.220***	-7.243***	-7.221***
	(0.976)	(0.977)	(0.978)
Observations	3,299	3,293	3,289

Regression

	Mineral depletion ratio	Mineral depletion ratio	Mineral depletion ratio
VARIABLES	(% GNI) (log)	(% GNI) (log)	(% GNI) (log)
Norwegian ODA (log) $_{t-1}$	-0.0117	-0.0147	-0.0141
	(0.0418)	(0.0406)	(0.0407)
DAC ODA (log) $_{t-1}$	0.0402	0.0648	0.0714
	(0.0669)	(0.0670)	(0.0670)
Population (log) $_{t-1}$		0.767***	0.840***
		(0.166)	(0.167)
GDP per capita (log) $_{t-1}$		-0.0524	-0.0512
		(0.0753)	(0.0753)
Electoral democracy index $_{t-1}$		0.158	0.217
		(0.138)	(0.139)
Civil war $_{t-1}$			0.0497
			(0.0463)
Peace years			0.00626***
			(0.00185)
Constant	-3.457***	-16.37***	-17.74***
	(0.866)	(3.154)	(3.168)
Observations	3,299	3,293	3,289

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3. The effects of ODA on net forest depletion rate (% GNI). Estimated using the Heckman two-step model

Selection equation

	(1)	(2)	(3)
VARIABLES	Norwegian ODA dummy	Norwegian ODA dummy	Norwegian ODA dummy
DAC ODA (log)	0.392***	0.392***	0.390***
	(0.0606)	(0.0606)	(0.0607)
GDP per capita (log)	-0.443***	-0.444***	-0.444***
	(0.0306)	(0.0307)	(0.0307)
Population (log)	0.449***	0.451***	0.451***
	(0.0249)	(0.0250)	(0.0250)
Electoral democracy index	0.596***	0.602***	0.599***
	(0.131)	(0.132)	(0.132)
Civil war	-0.0656	-0.0739	-0.0728
	(0.101)	(0.101)	(0.101)
IMR	-0.127	0.199**	0.197*
	(0.1000)	(0.101)	(0.101)
Constant	-7.203***	-7.227***	-7.204***
	(0.982)	(0.983)	(0.984)
Observations	3,240	3,234	3,230

Regression

	Net forest depletion rate	Net forest depletion rate	Net forest depletion rate
VARIABLES	(% GNI) (log)	(% GNI) (log)	(% GNI) (log)
Norwegian ODA (log) $_{t-1}$	0.00922	-0.00764	-0.0112
	(0.0260)	(0.0249)	(0.0250)
DAC ODA (log) $_{t-1}$	0.179***	0.141***	0.145***
	(0.0422)	(0.0413)	(0.0414)
Population (log) $_{t-1}$		0.121	0.115
		(0.105)	(0.106)
GDP per capita (log) $_{t-1}$		-0.303***	-0.293***
		(0.0475)	(0.0476)
Electoral democracy index $_{t-1}$		0.700***	0.724***
		(0.0848)	(0.0855)
Civil war $_{t-1}$			0.0730**
			(0.0287)
Peace years			-0.00103
			(0.00113)
Constant	-3.485***	-3.308*	-3.360*
	(0.549)	(1.990)	(2.001)
Observations	3,240	3,234	3,230

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.2 Aid and strong sustainability

To measure aid's effects on strong sustainability, measures of CO_2 emissions per capita and total greenhouse gas emissions per capita are used. Table 4 shows the analyses of the effects of DAC and Norwegian ODA on these two measures, estimated with fixed effects OLS and Driscoll-Kraay standard errors. Following the same structure as in Table 1, columns 1 and 4 shows the effects of the main independent variables without any controls added, columns 2 and 5 shows the effects after adding the country related controls, and in columns 3 and 6 the war related controls are added to the models. In columns 1 and 2, Norwegian ODA shows a negative effect on per capita CO_2 emissions, but in column 3 the significance disappears, and instead, aid from the other DAC members shows a negative effect, significant on a 90 percent confidence level. Even though the effect is so small that it arguably is negligible, this makes for a noteworthy finding. Turning to the control variables, there are no observable effects of neither population nor the war related controls. Wealth, as expected, shows a strong positive effect on CO_2 emissions, meaning that the richer a country becomes, the more CO_2 it emits per capita. Wealthier countries are expected to be more industrialised and thus produce and emit higher levels of CO_2. Democracy also shows a highly significant positive relation with CO_2 emissions. The democracy measure may capture the effects of development in a country, which then would explain the observed effects by indicating the presence of the Environmental Kuznets Curve. As mentioned in the previous chapter, the Environmental Kuznets Curve theorises the relationship between CO_2 emissions and development to take on an inverted U-shape, such that emissions rise in the early stages of development, plateaus when development reaches a certain level, and then decrease with further development. To examine this, the effect is modelled by adding a quadratic function of the Electoral democracy index to the regression estimation (Table 8 in Appendix A). The results confirm that the relationship between democracy and CO_2 emissions indeed takes the shape of an inverted U, thereby adding to the evidence of the Environmental Kuznets Curve.

Table 4. The effects of ODA on strong sustainability. Estimated using OLS with Driscoll-Kraay standard errors.

	(1)	(2)	(3)		(4)	(5)	(6)
VARIABLES	CO_2, tons per capita (log)	CO_2, tons per capita (log)	CO_2, tons per capita (log)	VARIABLES	GHG emissions, kt CO_2 eqiv. per capita (log)	GHG emissions, kt CO_2 eqiv. per capita (log)	GHG emissions, kt CO_2 eqiv. per capita (log)
Norwegian ODA (log) $_{t-1}$	-0.0355**	-0.0159**	-0.00805	Norwegian ODA (log) $_{t-1}$	-0.109*	-0.0899**	-0.0817**
	(0.0166)	(0.00711)	(0.00695)		(0.0537)	(0.0416)	(0.0388)
DAC ODA (log) $_{t-1}$	-0.0196	-0.0280	-0.0339*	DAC ODA (log) $_{t-1}$	-0.0334	-0.0204	-0.0277
	(0.0222)	(0.0178)	(0.0180)		(0.0292)	(0.0313)	(0.0325)
Population (log) $_{t-1}$		0.0671	0.0714	Population (log) $_{t-1}$		0.202	0.236
		(0.0699)	(0.0748)			(0.240)	(0.241)
GDP per capita (log) $_{t-1}$		0.459***	0.468***	GDP per capita (log) $_{t-1}$		0.321***	0.320***
		(0.0391)	(0.0395)			(0.0406)	(0.0422)
Electoral democracy index $_{t-1}$		0.124***	0.110**	Electoral democracy index $_{t-1}$		0.0908	0.107
		(0.0396)	(0.0481)			(0.0933)	(0.0902)
Civil war $_{t-1}$			-0.00178	Civil war $_{t-1}$			0.0380
			(0.0102)				(0.0240)
Peace years			0.000428	Peace years			0.00308***
			(0.000336)				(0.000824)
Constant	0.673**	-	-	Constant	-4.368***	-	-
	(0.250)	-	-		(0.523)	-	-
Observations	2,765	2,638	2,595	Observations	2,453	2,334	2,312
Number of groups	147	144	139	Number of groups	142	139	135

Driscoll-Kraay standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Columns 4, 5 and 6 shows the analyses of the effects of aid on kilotons per capita of greenhouse gas emitted (GHG). As with CO_2 emissions, without any controls in the model, Norwegian ODA shows a negative effect on GHG, statistically significant with 90 percent confidence, whereas DAC ODA has no statistically significant effects. But contrary to the findings on CO_2 emissions, the measured effect of Norwegian aid does not disappear after adding the control variables – the significance does in fact increase to a 95 percent confidence level – and the effects of aid from the other DAC members remains insignificant. As for the controls, population size is also here insignificant, meaning that these analyses show no evidence for larger countries polluting neither more nor less than smaller countries in terms of per capita pollution. Wealth, measured by GDP per capita, is also showing the same effects as in Table 3, with wealthier countries emitting higher levels of GHG per capita than poorer countries do. The democracy measure is, on the other hand, nonsignificant, which differs from the results in Table 3, where the observed effect of democracy was positive and significant. To investigate whether the relationship between democracy and greenhouse gas emissions also is curvilinear, and that the curvilinearity hides the significant effects when only estimating the linear relationship, a quadratic function of the Electoral democracy index is added in Table 9 in the Appendix. The results show that this is the case. In column 3, after adding the war related controls, the effect of Norwegian ODA remains negative and significant, suggesting that a one percent increase in Norwegian aid in year *t-1* leads to a reduction in greenhouse gas emissions per capita in the recipient country of 0.08 percent in year *t*. DAC ODA, population, and democracy remains insignificant, and the measured effect of wealth remains practically unchanged, positive and statistically significant. As seen, there are no observable significant effects of civil war. However, history of peace, measured by the number of years since the last conflict, is positive and highly significant.

Moving on to estimations using the Heckman model, the selection equations in Tables 5 and 6 shows the same pattern as the ones in Tables 2 and 3, countries receiving DAC ODA, having a large population, scoring high on the Electoral democracy index, and being less wealthy are more likely to receive Norwegian aid. Contrary to the IMR in Tables 2 and 3, the IMR calculated in Tables 5 and 6 are not significant other than in the first column where only the main independent variables are included. This does not necessarily mean that there is no sample selection bias but may be due to weak exclusion restrictions (Certo, Busenbark, Woo, & Semadeni, 2016). Nevertheless, the results from the Heckman model analyses are presented in Tables 5 and 6.

Table 5 estimates the effects of DAC and Norwegian ODA on per capita CO_2 emissions, and the results from this estimation technique are quite similar to those estimated with OLS and Driscoll-Kraay standard errors in Table 4. In columns 1 and 2, Norwegian aid shows a statistically significant negative effect on the emissions and DAC aid shows no significant effects, but after adding all the control variables in column 3, the significant effect of Norwegian aid disappears, and DAC aid becomes significant, at least on a 90 percent confidence level. The control variables are showing similar effects as in Table 4, with wealth and democracy showing positive effects on CO_2 emissions. Table 6 presents the results from the Heckman model estimation of aid's effects on per capita greenhouse gas emissions (GHG), and these results are similar to those presented in Table 4. Norwegian ODA is shown to have a negative effect on GHG, statistically significant on a 99 percent confidence level throughout the models. The strength of the effect is also almost identical between the two estimation techniques. The results for the control variables are also practically identical to those in Table 4.

Table 5. The effects of ODA on CO_2 emissions, tons per capita. Estimated using the Heckman two-step model

Selection equation			
	(1)	(2)	(3)
VARIABLES	Norwegian ODA dummy	Norwegian ODA dummy	Norwegian ODA dummy
DAC ODA (log)	0.352***	0.352***	0.350***
	(0.0612)	(0.0613)	(0.0613)
GDP per capita (log)	-0.458***	-0.459***	-0.459***
	(0.0311)	(0.0312)	(0.0312)
Population (log)	0.440***	0.443***	0.443***
	(0.0252)	(0.0253)	(0.0253)
Electoral democracy index	0.626***	0.627***	0.624***
	(0.132)	(0.133)	(0.133)
Civil war	-0.0596	-0.0685	-0.0674
	(0.102)	(0.102)	(0.102)
IMR	0.268***	-0.0366	-0.0374
	(0.0565)	(0.0388)	(0.0383)
Constant	-6.549***	-6.583***	-6.557***
	(0.992)	(0.993)	(0.994)
Observations	3,059	3,047	3,043
Regression			
VARIABLES	CO_2, tons per capita (log)	CO_2, tons per capita (log)	CO_2, tons per capita (log)
Norwegian ODA (log) $_{t-1}$	-0.0264*	-0.0176*	-0.0106
	(0.0139)	(0.00898)	(0.00884)
DAC ODA (log) $_{t-1}$	0.0246	-0.0170	-0.0251*
	(0.0244)	(0.0144)	(0.0141)
Population (log) $_{t-1}$		-0.00322	-0.00195
		(0.0397)	(0.0393)
GDP per capita (log) $_{t-1}$		0.437***	0.439***
		(0.0163)	(0.0160)
Electoral democracy index $_{t-1}$		0.122***	0.107***
		(0.0310)	(0.0307)
Civil war $_{t-1}$			-0.00197
			(0.00996)
Peace years			0.000369
			(0.000416)
Constant	-1.123***	-3.129***	-3.100***
	(0.313)	(0.735)	(0.726)
Observations	3,059	3,047	3,043

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6. The effects of ODA on greenhouse gas emissions, kilotons of CO_2 equivalent per capita. Estimated using the Heckman two-step model

Selection equation

	(13)	(14)	(15)
VARIABLES	Norwegian ODA dummy	Norwegian ODA dummy	Norwegian ODA dummy
DAC ODA (log)	0.632***	0.632***	0.630***
	(0.0936)	(0.0938)	(0.0939)
GDP per capita (log)	-0.463***	-0.465***	-0.466***
	(0.0331)	(0.0332)	(0.0332)
Population (log)	0.519***	0.523***	0.523***
	(0.0296)	(0.0297)	(0.0297)
Electoral democracy index	0.528***	0.528***	0.525***
	(0.141)	(0.141)	(0.141)
Civil war	-0.0988	-0.111	-0.110
	(0.105)	(0.105)	(0.105)
IMR	0.388***	-0.0848	-0.125
	(0.132)	(0.160)	(0.160)
Constant	-10.93***	-10.98***	-10.95***
	(1.437)	(1.440)	(1.441)
Observations	2,788	2,776	2,773

Regression

	GHG emissions, kt CO_2	GHG emissions, kt CO_2	GHG emissions, kt CO_2
VARIABLES	eqiv. per capita (log)	eqiv. per capita (log)	eqiv. per capita (log)
Norwegian ODA (log) $_{t-1}$	-0.0932***	-0.0897***	-0.0811***
	(0.0206)	(0.0221)	(0.0219)
DAC ODA (log) $_{t-1}$	0.0508	0.000785	-0.00995
	(0.0413)	(0.0399)	(0.0398)
Population (log) $_{t-1}$		0.151	0.193
		(0.109)	(0.109)
GDP per capita (log) $_{t-1}$		0.346***	0.346***
		(0.0450)	(0.0451)
Electoral democracy index $_{t-1}$		0.0481	0.0488
		(0.0815)	(0.0820)
Civil war $_{t-1}$			0.0322
			(0.0262)
Peace years			0.00414***
			(0.00111)
Constant	-7.362***	-11.28***	-11.94***
	(0.527)	(2.008)	(2.013)
Observations	2,788	2,776	2,773

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5 Discussion

This thesis has focused on the practical and political aspects of aid and aid effectiveness. On the one hand, development aid has a practical importance, as the poorest parts of the world arguably need some sort of assistance to develop end grow, and on the other, development aid is highly political, both because bilateral aid donors are dependent upon the support from the public. Thus, they would want to make the taxpayers money appear as well spent as possible, and because the donors depend on support from and cooperation with the international community, and fulfilling their commitments towards institutions such as the UN, the IMF, and the World Bank is a way of earning the favour of the international community. I begin this discussion by summarising my main results.

5.1 The results summarised

The analyses of the two measures of weak sustainability, namely mineral depletion and net forest depletion, show mixed results. The analyses found no significant effects of Norwegian ODA on neither the mineral depletion ratio nor on net forest depletion. ODA from the other DAC members does on the other hand show a highly statistically significant positive effect on forest depletion in the Heckman model in Table 3. These results are not supported by the more robust estimation with Driscoll-Kraay standard errors in Table 1, and consequently no definitive conclusions can be drawn based on these results, but the results are interesting, nevertheless, as they may indicate effects by DAC ODA not captured in Table 1. In addition to the analyses on the two resource depletion measures a similar analysis using the summed natural resource depletion ratio is tried as a robustness check. Neither Norwegian ODA nor DAC ODA shows any significant effects on the aggregate natural resources depletion, neither in the OLS regression with Driscoll-Kraay standard errors (Table 9 in Appendix A) nor in the Heckman analysis (Table 11 in Appendix A). This supports the overall finding that ODA, no matter from whom it comes, does not affect an aid recipient country's weak sustainable development.

Moving on to the control variables, population shows a highly significant positive effect on the mineral depletion rate, suggesting that countries deplete their mineral resources at a higher rate the larger their populations become. whereas on net forest depletion, the population size has no significant effects. The observed effects of wealth also differ between the different measures. There are no measurable effects of GDP per capita on mineral depletion or aggregate natural resources depletion, but it has a highly significant negative effect on forest depletion. These results are confirmed, and thus strengthened, by the robustness checks in Table 9 in the

Appendix. The impact of democracy is also varying between the dependent measures; mineral resources are depleted with no regards to the level of democracy, whereas forest depletion sharply increases with increased democracy in a country. Turning to the war related controls, one can also here see differences between the models. Being in a state of civil war has no effect on the mineral depletion rate the year after, but increases forest depletion by roughly 7.5 percent, cet. par. Peace history, on the other hand, shows a positive effect on mineral depletion, but no effect on forest depletion.

The results from the analyses of aids effects on strong sustainability, done with the emission variables, differ from those with the resource emission variables, in that the former in fact are affected by the ODA flows. After adding all control variables to the model, DAC ODA shows a negative effect on CO_2 emissions, statistically significant on with a 90 percent confidence level, while the effects of Norwegian ODA disappear when adding the last pair of control variables. Substantively, an i.e. ten percent increased DAC ODA in year *t-1* is related to a decrease in CO_2 emissions per capita of roughly 0.34 percent in year *t*. With greenhouse gases, the results are opposite, as there are no measurable effects of DAC AID, while Norwegian ODA has a highly significant negative measured effect. Substantively, the effect of a ten percent increase in Norwegian ODA leads to a 0.82 percent decrease in greenhouse gas emissions per capita the year after. Of the control variables, population and civil war show no significant effects. Democracy has positive – but curvilinear, as shown in Table 8 in the Appendix, suggesting the appearance of the Environmental Kuznets Curve – and significant effects on CO_2 emissions, but no observable effects on greenhouse gas emissions, while history of peace has positive and significant effects on greenhouse gas emissions, and no observable effects on CO_2 emissions. The clearest result is that wealth has a highly significant positive effect on both measures of emissions, indicating that the richer a country becomes, the more pollution it emits.

5.2 Discussion

Having presented the main results, this section revisits the hypotheses stated in section 2.5. Alas, most studies in the AAPL have found that aid agencies' practice is far from the targets set in the Paris Declaration and the Accra Agenda for Action (Birdsall et al., 2010; Knack et al., 2011; Palagashvili, 2019; Palagashvili & Williamson, 2018). According to the UNs Sustainable Development Goals, sustainability is a key aspect of development both in the least and the most developed parts of the world, and development aid is one of the rich countries' most far reaching tools available, to help poorer and less developed countries progress. How do the aid agencies

fare when it comes to the promotion of sustainable development? Are the results as sobering as the previous literature suggests? If the findings are as hypothesised, we would see no effects of DAC ODA on neither weak nor strong sustainable development, while Norwegian ODA is expected to have positive effects.

To answer these questions four measures have been used, to try and capture the sustainability in the aid recipient countries: the depletion ratio of mineral resources, net depletion of forests, CO_2 emissions, and greenhouse gas emissions. Firstly, the mineral depletion ratio, measuring the ratio of the value of the stock of mineral resources to the remaining reserve lifetime as a percentage of GNI, does not seem to be affected by neither Norwegian nor the rest of the DAC members' ODA flows. As Easterly and Williamson (2011) point out, examining the effects and effectiveness of aid is a case of proxies and theories, and the lack of significant effects may be because the mineral depletion rate simply not is the best measure of sustainable development. On the other hand, the findings in the previous literature have mostly been showing a lack of effects of aid rather than strong significant relations, and this result thereby joins the ranks of the previous literature. With regards to the hypotheses this thesis builds upon – H_1 being that ODA from other DAC members than Norway do not have any effects on sustainable development in the recipient country, and H_2 being that Norwegian ODA has positive effects on sustainable development in the recipient country – the first findings strengthens H_1, while H_2 is rejected, as there are no discernible differences between Norwegian and DAC ODA. This finding is further strengthened by the results in the robustness checks (Tables 10 and 11 in Appendix A), where no effects of neither Norwegian nor DAC ODA on the aggregate resource depletion ratio can be found. By strengthening the assumption that aid is ineffective, at the same time the aid proponents' arguments are weakened.

The results from the analysis of the effects of ODA on net forest depletion paint a different picture, albeit not a prettier one. Norwegian ODA does neither here show any effects on the dependent measure, but the aid from the other donors is seemingly related to a substantial increase in net forest depletion in the recipient country, even after controlling for possible intermediate factors. The picture painted by the analyses is that forest depletion is related to normative bad causes; as seen, forests are depleted more the poorer a country is, and more the immediate year after a civil war, thus indicating that forest depletion can be seen as an outcome of bad causes. And yet, as the analyses show, forest depletion also increases as a country receives more aid from the DAC donors, with the effect being approximately half as strong that of GDP per capita, e.g. if the DAC donors increase their ODA to a country by five percent, the increase in forest depletion will be about the same as it would with a decrease in GDP per capita

by 2.5 percent. These results are not supported by the results in Table 1 where an arguably better estimation technique is applied, which does not strengthen the finding. Although these results do not strengthen the hypotheses, they are contributing further to the pessimistic views on aid. Not only is aid in lack of normative positive effects, aid is here shown to be harmful to the recipient countries, in support of the arguments of Moyo (2009).

The analyses of aids effects on strong sustainability show different results. Before adding the war related controls to the models, Norwegian ODA seemingly has a negative effect on the amount of CO_2 a recipient country emits per capita, but after adding the war controls, it is the aid from the other donors that is showing a significant effect (with a 90 percent confidence level), whereas the significance of the Norwegian aid results disappears. These results are supported by those done with the Heckman model in Table 5. Contrary to the previous results, this is good news for the proponents of aid. CO_2 emissions is arguably one of the greatest challenges to the climate, and aid contributing to decreasing the emissions is not only good for the recipient country, but also for the rest of the planet. However, when examining the strength of the effect, it is seen that it is almost negligible. For example, in 2014, South Africa's CO_2 emissions were 8.98 metric tons per capita. A hypothetical ten percent increase in ODA from the DAC members other than Norway in 2014 would thus result in South African CO_2 emissions per capita being 8.95 metric tons per capita in 2015 cet. par., a mere 0.3 percent decrease with a ten percent increase in aid. The effect pales even more when noting that the ODA from all DAC donors but Norway in 2014 was 2010US$ 16,929.57 per capita, and that a ten percent increase would mean increasing the aid to 2010US$ 18,622.53 per capita. In other words, even though there is an apparent effect of DAC ODA on CO_2 emissions, the effect is so small that it is negligible, and arguably H_1 is further strengthened. The effect of Norwegian ODA apparent in the models before the war related controls are added disappear after adding said controls, and there is no evidence for H_2 in the findings so far.

The analyses of ODA's effect on greenhouse gas emissions per capita show no effect of ODA from the DAC donors other than Norway, but Norwegian ODA has a statistically significant negative effect. This is an interesting finding in two ways; firstly, because there is a measurable difference between Norway and the other DAC donors, and secondly, because the results of the greenhouse gas emissions differ from those of only the CO_2 emissions. The explanation for both may lie in the way the variables are measured. The CO_2 variable measures CO_2 emissions from the burning of fossil fuels and the manufacture of cement (World Bank, 2020a), while the greenhouse gas emissions variable takes into account CO_2 emissions from burning fossil fuels and cement manufacturing, as well as from forest fires, post-burn decay,

peat fires and decay of drained peatlands, in addition to other greenhouse gases (CH_4, N_2O, and F-gases, see the section 3.2.1) (World Bank, 2020c). In other words, the greenhouse gas emissions are a more wide-reaching measure of atmospheric pollution, and including the methane and nitrous oxide emissions is particularly important when studying agricultural economies (World Bank, 2020c). As mentioned in section 2.4.2, development assistance directed towards mitigating climate change is for a large part going towards improving the agricultural and sewage and waste treatment sectors. Given that nearly 70 percent of the population in the LDCs are engaged in agriculture (United Nations, 2011), and that the volume and share of ODA going to the agricultural sector has been increasing during the last two decades as agricultural aid has been identified as having a greater effect on poverty reduction than other aid (Datt, 1999; Diao, Hazell, Resnick, & Thurlow, 2007; Ssozi, Asongu, & Amavilah, 2019), the greenhouse gas measure may both capture the effects of climate related aid, and also capture some of the effects of agricultural development. If this is the case, greenhouse gas emissions is arguably a viable measure of sustainable development, as it not only captures the direct effect, e.g. atmospheric pollution (SDG no. 13), but also other aspects of sustainable development such as hunger and food security (SDG no. 2) and sustainable agriculture (SDG no. 9).

Norwegian ODA is shown to decrease the greenhouse gas emissions in the recipient countries, with a substantive effect of approximately 0.08 percent decreased per capita emissions per one percent increase in ODA flows per capita. To get some perspective, in 2005 the Central African Republic emitted 112 metric tons of greenhouse gases measured in CO_2 equivalents per capita. A hypothetical ten percent increase in Norwegian ODA per capita in 2005 would then lead to a 0.8 percent decrease in the emissions in 2006, resulting in the greenhouse gas emissions being reduced to approximately 111 tons per capita. In 2005, Norwegian ODA to the Central African Republic totalled 2010US$ 297, meaning that a ten percent increase would have the Norwegian ODA totalling to approximately 2010US$ 327 per capita. It is arguable whether this effect is substantial enough to draw firm conclusions from but given the ambiguous nature of measuring the effectiveness of development assistance, one should perhaps not hope for much clearer results.

6 Conclusion

This thesis addresses the question of aid and aid agency effectiveness, by examining whether development aid is contributing to sustainable development in the recipient countries. It also focuses on Norway as an aid donor, and examines the claim that Norway is a 'better' donor than the other DAC members by comparing the effects of Norwegian ODA to those of ODA from the other DAC members. By using measures of natural capital depletion and atmospheric pollution, the effects of aid on weak and strong sustainability is examined, respectively. The results show little evidence for DAC donor aid having a positive effect on sustainable development. The only robust significant effect of DAC aid on sustainable development is on CO_2 emissions per capita, but this is so small that it in effect is negligible. Norwegian development aid does on the other hand show a positive significant effect on greenhouse gas emissions per capita, indicating that there may be some truth to the assumption that Norway is a 'better' donor. This result is also robust to the selection bias in Norwegian aid allocation, indicating that Norway is not allocating aid towards 'easier' recipients.

The findings in this thesis adds to the existing literature on development aid, stating that researching aid and aid effectiveness is a task involving proxies and theoretical arguments (Easterly & Williamson, 2011), as there are no indicators directly measuring the effects, and only the effects, one wants to measure, and the causal relations are not self-evident. With the conclusion of Hansen and Tarp (2000) it is also likely that the results of the analyses in this thesis would have been different, had other measures and indicators been used. Nevertheless, the main findings in this thesis indicates that, depending on which indicator is used, there is a measurable difference between Norway as a donor and the rest of the DAC members, with Norway seemingly contributing more effectively, and thus more in line with the stated targets and goals, than the other DAC members. There are no conclusive evidence of the aid from the DAC donors other than Norway having any substantial significant impact on neither weak nor strong sustainable development in the recipient countries. Additionally, several of the analyses demonstrates the presence of the Kuznets Curve. While this is not exactly within the scope of this thesis, it is both an interesting finding in itself, and may also serve as a test of the reliability of the used indicators, further strengthening the robustness of the overall findings.

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Appendix A

Tables not included in-text

Table 7. Testing for a curvilinear relationship between democracy and mineral depletion ratio, using OLS with Driscoll-Kraay standard errors

VARIABLES	(1) Mineral depletion ratio (% GNI) (log)	(2) Mineral depletion ratio (% GNI) (log)	(3) Mineral depletion ratio (% GNI) (log)	(4) Mineral depletion ratio (% GNI) (log)	(5) Mineral depletion ratio (% GNI) (log)
Norwegian aid (log) $_{t-1}$	-0.00642	-0.00882	-0.00834	0.00732	0.00781
	(0.0229)	(0.0249)	(0.0252)	(0.0240)	(0.0241)
DAC aid (log) $_{t-1}$	-0.00154	0.00122	0.000917	0.0278	0.0281
	(0.0270)	(0.0270)	(0.0272)	(0.0335)	(0.0338)
Population (log) $_{t-1}$		0.661***	0.691***	0.806***	0.838***
		(0.163)	(0.153)	(0.163)	(0.159)
GDP per capita (log) $_{t-1}$		-0.00140	0.000177	-0.00223	-0.000197
		(0.0564)	(0.0558)	(0.0538)	(0.0535)
Electoral democracy index $_{t-1}$		0.188**	-0.258	0.209**	-0.267
		(0.0830)	(0.444)	(0.0860)	(0.458)
Civil war $_{t-1}$				0.0603	0.0599
				(0.0521)	(0.0520)
Peace years				0.00607***	0.00597***
				(0.00179)	(0.00175)
Electoral democracy index $_{t-1}$ * Electoral democracy index $_{t-1}$			0.508		0.539
			(0.510)		(0.529)
Constant	-	-	-	-15.05***	-15.52***
	-	-	-	(2.588)	(2.506)
Observations	2,958	2,921	2,921	2,861	2,861
Number of groups	147	144	144	139	139

Driscoll-Kraay standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8. Testing for a curvilinear relationship between democracy and CO_2 emissions, using OLS with Driscoll-Kraay standard errors

VARIABLES	(1) CO_2, tons per capita (log)	(2) CO_2, tons per capita (log)	(3) CO_2, tons per capita (log)
Norwegian ODA (log) $_{t-1}$	-0.0355**	-0.0162**	-0.00833
	(0.0166)	(0.00713)	(0.00695)
DAC ODA (log) $_{t-1}$	-0.0196	-0.0294	-0.0358*
	(0.0222)	(0.0182)	(0.0182)
Population (log) $_{t-1}$		0.0503	0.0568
		(0.0679)	(0.0742)
GDP per capita (log) $_{t-1}$		0.458***	0.467***
		(0.0393)	(0.0397)
Electoral democracy index $_{t-1}$		0.313***	0.275**
		(0.111)	(0.124)
Electoral democracy index $_{t-1}$ * Electoral democracy index $_{t-1}$		-0.215**	-0.187*
		(0.103)	(0.100)
Civil war $_{t-1}$			-0.00197
			(0.0103)
Peace years			0.000483
			(0.000323)
Constant	0.673**	-	-
	(0.250)	-	-
Observations	2,765	2,638	2,595
Number of groups	147	144	139

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9. Testing for a curvilinear relationship between democracy and GHG emissions, using OLS with Driscoll-Kraay standard errors

VARIABLES	(1) GHG emissions, kt CO_2 eqiv. per capita (log)	(2) GHG emissions, kt CO_2 eqiv. per capita (log)	(3) GHG emissions, kt CO_2 eqiv. per capita (log)	(4) GHG emissions, kt CO_2 eqiv. per capita (log)
Norwegian ODA (log) $_{t-1}$	-0.109*	-0.0899**	-0.0817**	-0.0833**
	(0.0537)	(0.0416)	(0.0388)	(0.0393)
DAC ODA (log) $_{t-1}$	-0.0334	-0.0204	-0.0277	-0.0376
	(0.0292)	(0.0313)	(0.0325)	(0.0347)
Population (log $_{t-1}$)		0.202	0.236	0.172
		(0.240)	(0.241)	(0.249)
GDP per capita (log) $_{t-1}$		0.321***	0.320***	0.318***
		(0.0406)	(0.0422)	(0.0414)
Electoral democracy index $_{t-1}$		0.0908	0.107	0.751**
		(0.0933)	(0.0902)	(0.324)
Civil war $_{t-1}$			0.0380	0.0369
			(0.0240)	(0.0242)
Peace years			0.00308***	0.00324***
			(0.000824)	(0.000805)
Electoral democracy index $_{t-1}$ * Electoral democracy index $_{t-1}$				-0.728**
				(0.322)
Constant	-4.368***	-	-	-
	(0.523)	-	-	-
Observations	2,453	2,334	2,312	2,312
Number of groups	142	139	135	135

Driscoll-Kraay standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10. Robustness check. The effects of ODA on natural resource depletion. Estimated using fixed effects OLS with Driscoll-Kraay standard errors

VARIABLES	(1) Natural resource depletion ratio (% GNI) (log)	(2) Natural resource depletion ratio (% GNI) (log)	(3) Natural resource depletion ratio (% GNI) (log)
Norwegian aid (log) $_{t-1}$	0.0375	0.0316	0.0298
	(0.0530)	(0.0497)	(0.0493)
DAC aid (log) $_{t-1}$	-0.00554	-0.0213	-0.0176
	(0.0376)	(0.0364)	(0.0360)
Population (log) $_{t-1}$		0.343	0.396
		(0.265)	(0.257)
GDP per capita (log) $_{t-1}$		-0.0433	-0.0479
		(0.139)	(0.138)
Electoral democracy index $_{t-1}$		0.407**	0.470**
		(0.166)	(0.178)
Civil war $_{t-1}$			0.0951*
			(0.0498)
Peace years			0.00489*
			(0.00281)
Constant	-	-4.680	-5.701
	-	(4.629)	(4.494)
Observations	2,854	2,818	2,794
Number of groups	143	140	137

Driscoll-Kraay standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 11. Robustness check. The effects of ODA on natural resource depletion. Estimated with the Heckman model

Selection equation			
VARIABLES	(1) Norwegian ODA dummy	(2) Norwegian ODA dummy	(3) Norwegian ODA dummy
DAC ODA (log)	0.390***	0.390***	0.389***
	(0.0607)	(0.0607)	(0.0608)
GDP per capita (log)	-0.444***	-0.446***	-0.446***
	(0.0307)	(0.0307)	(0.0307)
Population (log)	0.450***	0.453***	0.453***
	(0.0250)	(0.0250)	(0.0250)
Electoral democracy index	0.603***	0.609***	0.607***
	(0.132)	(0.132)	(0.132)
Civil war	-0.0653	-0.0737	-0.0728
	(0.101)	(0.101)	(0.101)
IMR	0.249	0.445***	0.420***
	(0.153)	(0.154)	(0.155)
Constant	-7.201***	-7.225***	-7.209***
	(0.983)	(0.984)	(0.984)
Observations	3,236	3,230	3,227

Regression			
VARIABLES	Natural resource depletion ratio (% GNI) (log)	Natural resource depletion ratio (% GNI) (log)	Natural resource depletion ratio (% GNI) (log)
Norwegian ODA (log) $_{t-1}$	0.0323	0.0237	0.0228
	(0.0395)	(0.0377)	(0.0380)
DAC ODA (log) $_{t-1}$	0.0350	0.0141	0.0225
	(0.0643)	(0.0639)	(0.0640)
Population (log) $_{t-1}$		0.375**	0.435***
		(0.164)	(0.165)
GDP per capita (log) $_{t-1}$		-0.0753	-0.0752
		(0.0752)	(0.0750)
Electoral democracy index $_{t-1}$		0.406***	0.460***
		(0.133)	(0.133)
Civil war $_{t-1}$			0.0977**
			(0.0451)
Peace years			0.00591***
			(0.00178)
Constant	-1.995**	-7.622**	-8.835***
	(0.836)	(3.117)	(3.128)
Observations	3,236	3,230	3,227

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix B

Descriptive statistics

Table 12. Descriptive statistics and distribution of all variables

Variable	Observations	Mean	Std. Dev.	Min	Max	Source
Mineral depletion ratio (% of GNI) (log)	3,920	-1.487	1.257	-2.303	3.152	World Development Indicators (World Bank, 2020d)
Natural resource depletion ratio (% of GNI) (log)	3,705	0.574	1.716	-2.303	4.514	World Development Indicators (World Bank, 2020d)
Net forest depletion rate (% of GNI) (log)	3,715	-1.146	1.584	-2.303	3.712	World Development Indicators (World Bank, 2020d)
CO_2 emissions, tons per capita (log)	3,641	0.625	1.197	-1.169	4.253	World Development Indicators (World Bank, 2020d)
Greenhouse gas emissions, kilotons per capita (log)	3,231	-5.363	1.011	-7.725	-1.798	World Development Indicators (World Bank, 2020d)
Norwegian ODA per 1,000 capita (log)	3,241	8.280	0.391	-3.071	11.73	World Development Indicators (World Bank, 2020d)
DAC ODA per 1,000 capita (log)	3,955	11.35	0.494	-0.358	13.68	World Development Indicators (World Bank, 2020d)
Population (log)	4,353	15.85	1.687	11.15	21.05	World Development Indicators (World Bank, 2020d)
GDP per capita (log)	4,122	7.948	1.274	5.102	11.15	World Development Indicators (World Bank, 2020d)
Electoral democracy index	4,509	0.455	0.243	0.0170	0.922	Varieties of Democracy Project (Coppedge et al., 2020)
Civil war	4,003	0.196	0.397	0	1	Uppsala Conflict Data Program (Gleditsch et al., 2002)
Peace years	4,003	19.63	19.11	0	71	Uppsala Conflict Data Program (Gleditsch et al., 2002)

Countries under study

Afghanistan
Albania
Algeria
Angola
Argentina
Armenia
Azerbaijan
Bangladesh
Barbados
Belarus
Benin
Bhutan
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
Bulgaria
Burkina Faso
Burundi
Cabo Verde
Cambodia
Cameroon
Central African Republic
Chad
Chile
China
Colombia
Comoros
Congo, Dem. Republic
Congo, Republic
Costa Rica
Cote d'Ivorie
Croatia
Cuba
Cyprus
Czech Republic
Dominican Republic
Ecuador
Egypt, Arab Republic
El Salvador
Equatorial Guinea
Eritrea
Estonia
Eswatini
Ethiopia
Fiji
Gabon
Gambia, The
Georgia
Ghana
Guatemala
Guinea
Guinea-Bissau
Guyana
Haiti
Honduras
Hungary
India
Indonesia
Iran, Islamic Republic
Iraq
Israel
Jamaica
Jordan
Kazakhstan
Kenya
Korea, Republic
Kuwait
Kyrgyz Republic
Lao PDR
Latvia
Lebanon
Lesotho
Liberia
Libya
Lithuania
Madagascar
Malawi
Malaysia
Maldives
Mali
Mauritania
Mauritius
Mexico
Moldova
Mongolia
Montenegro
Morocco
Mozambique
Myanmar
Namibia
Nepal
Nicaragua
Niger
Nigeria
North Macedonia
Oman
Pakistan
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Poland
Romania
Russian Federation
Rwanda
Saudi Arabia
Senegal
Serbia
Sierra Leone
Slovak Republic
Slovenia
Solomon Islands
South Africa
South Sudan
Sri Lanka
Sudan
Suriname
Tajikistan
Tanzania
Thailand
Timor-Leste
Togo
Trinidad and Tobago
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