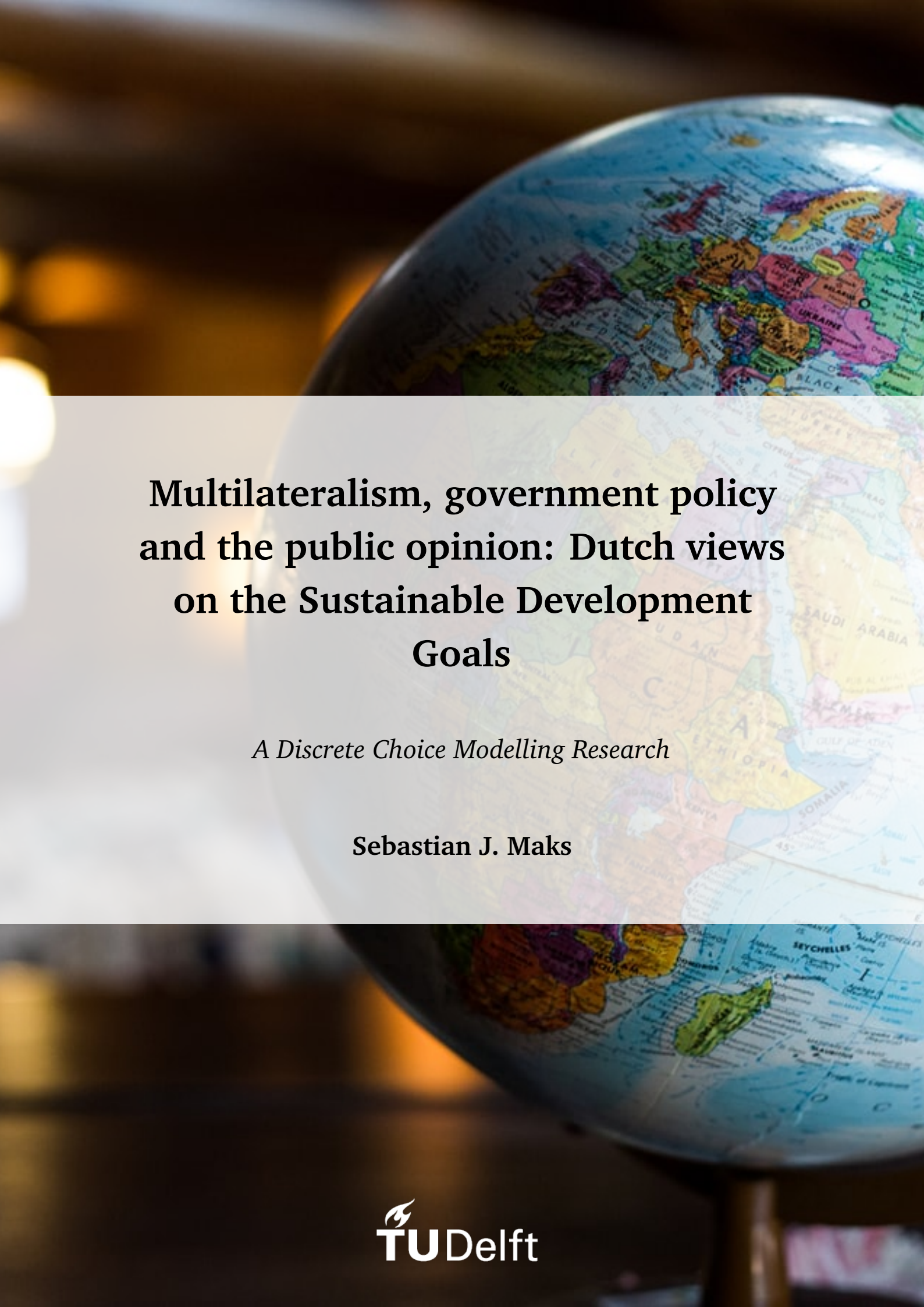

Multilateralism, government policy and the public opinion: Dutch views on the Sustainable Development Goals

A Discrete Choice Modelling Research

Sebastian J. Maks

TU Delft

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Multilateralism, government policy and the public opinion: Dutch views on the Sustainable Development Goals

A Discrete Choice Modelling Research

Master thesis submitted to Delft University of Technology in partial fulfilment of the requirements for the degree of

Master of Science
in Engineering and Policy Analysis

by
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Preface

The carefully constructed assortment of paper that lies before you marks the end of a lengthy period of research. Not only did I experience the past six months as highly enjoyable, I also learned a great deal from them. I am happy with the final product, and hope that I have managed to write a document that you as a reader enjoy digging through.

I would not be sitting here, writing this preface, without the valuable help of several people. Thanking them for their support is thus the least I can do. First of all, my graduation committee: Caspar Chorus, Niek Mouter and Nihit Goyal. Caspar, whom I have been in contact with since the very beginning, is a pleasure to work with. He is always willing to think along, he does not shy away from thinking outside the box, and he always replies to emails within ten minutes — a commendable trait in the all-digital times of COVID-19. Niek helped me keep my both feet on the ground. With his extensive experience in the domain of public consultation and policy advice, he managed to give me confidence when translating my crude, quantitative results to usable, practical policy recommendations. Finally, Nihit has offered me the highest helpfulness/time ratio I have experienced in my seven years of being a student. Despite only having spoken to each other for three short moments, his feedback was always extremely constructive and inspired me to think more abstractly about the context and effects of my research. All together, these three gentlemen have helped me lift my thesis to a higher level, and I am very grateful to them for that.

Sandra Pellegrom, the Dutch National SDG Coordinator, helped me with one of the most challenging aspects of my research: reaching out to Dutch policy makers. Also she provided me with interesting insights into the rationale behind the SDGs. I hope Sandra is able to use my results and that they help her in achieving progress in the context of the SDGs.

I would also like to thank my roommates, best friends and mixes of the two, for their friendship and support over the years. Our student times together have been an absolute pleasure, and an experience I would not have wanted to miss. It would be a lie if I said you have not had to listen to my occasional academic complaints. My apologies, guys. As you can see, it has hopefully all been worth it.

Throughout the seven years in Delft, and throughout the nineteen years before that, my lovely mum and dad always stood behind me. This did not change during my graduation period, and I can count myself lucky that they were always interested in what I was doing, and were always open to a discussion on the topic I was thinking about. I hope I have been able to make you proud. A special thanks goes to my sweet mum, who voluntarily ran through my entire thesis several times, looking for typo's and grammatical errors. I h0Pé I h@vën't maAade two manny OF thêm.

Finally, I want to thank my girlfriend Floor. Yes, for her interest in my research and listening to my tedious moments of pondering. But especially for putting up with me for the last five and half years – it must be difficult – and for being my best friend. Although you are undoubtedly going to be the diligent breadwinner of our household, and I will desperately try to follow in your footsteps, I hope I am worthy of your companionship for years to come.

For everyone who has reached this far, I wish you happy reading. If you have any questions, thesis-related or other, feel free to drop me an email at sebasmaks@gmail.com.

Sebastian Maks
Delft, August 2021

Summary

A multilateral organ, a national public and a national government are three entities that are inseparably intertwined. Together they form the dynamic policy triangle: a vibrant political system, constantly changing due to insights in the scholarly and public debate. This vibrancy leads to the fact that, despite an abundance of performed academic research, the relationship between the three entities remains a relevant field of investigation. A relatively unexplored aspect of the dynamic policy triangle is the working of a multilateral policy package within the relationship between national public and national government. An example of such a multilateral policy package is the United Nations's collection of Sustainable Development Goals (SDGs). These seventeen goals, constructed by means of a back-and-forth between the UN and national governments, outline a measurable path towards progress in the economic, social and environmental dimensions of sustainable development. The general assumption is that all the goals are of equal importance, and that no country should be left behind when attempting to achieve them. National governments seem to follow this rationale, and claim not to make any prioritisation of one SDG over another.

However, literature has shown that prioritisations of certain SDGs *are* likely to be made by national governments. One of the reasons for this likelihood is that national governments have differing opinions when it comes to the interpretation of sustainable development and the understanding of interlinkage between the SDGs. Also, the deadline attached to the goals is approaching fast, and countries with limited resources might as a result feel pressured to prioritise some goals. Yet, as far as is known, no research has been performed at the national level to find out if these prioritisations are in fact made by policy makers, and if so, to which extent. Additionally, it is conceivable that citizens also prioritise certain goals over others. Once again, no research seems to have be done in order to consult the public regarding their possible priority-setting behaviour. Both findings can potentially be harmful to society. If certain SDGs were to be prioritised, not transparently stating so and not consulting the public on their SDG preferences is politically unsustainable in a time in which some people are losing faith in politics and democracy.

This research partially fills these gaps in knowledge by performing a Discrete Choice Modelling experiment within the domain of the Netherlands. This is a method in which respondents of a survey are asked to review several hypothetical scenarios and to choose their preferred option out of a finite set of choices. As the SDG preferences of both Dutch policy makers and Dutch citizens are unexplored, it is relevant to perform empirical research for both groups. This empirical nature is desired because it enables the acknowledgement or debunking of conceptual theories

and provides magnitudes of effects, enlarging the possibilities of policy recommendations. The following main research question served as a guideline for this research:

How do the preferences of Dutch citizens and Dutch policy makers with respect to the Sustainable Development Goals differ, and which factors could explain these preferences?

In total, 36 Discrete Choice Models were estimated, either for the total sample of respondents, or for the samples of Dutch citizens and policy makers separately. The results provide indicative evidence that Dutch citizens and Dutch policy makers are to a great extent aligned in terms of their SDG preferences. For the main part, both groups do not prioritise certain goals over others. Also, when comparing individual SDGs between the two groups, no significant differences are to be found. The same goes for the effects that the current SDG situation has on SDG preferences, and the levels of Willingness to Pay; citizens and policy makers do not significantly differ. The results, however, do suggest several differences between the two groups. Firstly, Dutch citizens relatively reject SDG 17 – to revitalise global partnership for sustainable development – to several others. In this finding, a preference for planet- and people-related SDGs becomes apparent. It shows that citizens care more about SDG action itself than how it is actually brought forth. Policy makers do not show this behaviour. Secondly, Dutch policy makers prefer SDG 15 over SDGs 7, 8, and 9 in the Netherlands. This shows that biodiversity in their own country is prioritised, and that certain economical and innovative SDGs are deemed of lesser importance. Citizens do not show this behaviour.

The results suggest a preference for SDG action in the Global South; 13% more weight is attributed to SDG action in the Global South than in the Netherlands. This preference does not significantly differ between the two study groups. Also, the results indicate that both groups are loss-averse in the SDG context, meaning that SDG action is considered more important in a scenario when a certain SDG decreases than when it increases. It was found that citizens are more loss-averse than policy makers.

Several factors possibly explain the observed SDG preferences. First of all, the results suggest that the level of SDG knowledge of citizens has an effect on the preferences. Given the fact that the knowledge level was relatively high in the sample, this could explain why all SDG change parameters are significantly positive. Secondly, it was found that the level of individuals' development aid optimism has a significant effect on SDG preferences. As policy makers show slightly higher levels of this optimism, this might be an explanation for the minor deviations in SDG preferences. Thirdly, the effect of the level of perceived SDG complexity and SDG feasibility among policy makers is significant. As the policy makers sample shows low to moderate levels of perceived complexity and moderate to high levels of perceived feasibility, this might explain why SDG action is deemed important among policy makers. Finally, no effect of individuals' wish for development aid and their position within the domestic-foreign trade-off was found. Also, the results indicate that gender and educational level of citizens do not have an effect on SDG preferences.

Due to time and resource constraints that inevitably occur during a master's thesis, the research has some limitations. The most obvious is the limited size of the research sample. For both

study groups, the sample sizes are to small to be deemed representative for the corresponding populations. The large standard errors that are found in the results could be due to this limited sample size, but could also be due to a high extent of variability in the sample. This uncertainty should be taken into account when reviewing the research findings. Secondly, the sampling method used in this research induces forms of bias. Convenience and snowball sampling have led to slanted distributions in terms of citizens' SDG knowledge, age and political preference, and in terms of the origin of policy makers'. This can possibly have caused inaccurate results when generalising the results to the entire populations. Thirdly, hypothetical bias is inherent to the method of DCM. Respondents possibly show different behaviour than they would in real-life SDG choice situations. This can have led to an overestimation in SDG importance and levels of Willingness to Pay. Finally, several imperfections regarding the DCM experiment setup might have caused inaccuracies in the measurement process. These inaccuracies include: the exclusion of an opt-out alternative, the limited amount of SDG locations, and the limited amount of tax and SDG achievement levels.

The results enable several policy recommendations for the Dutch government. As described above, the findings suggest that Dutch citizens are largely aligned with Dutch policy makers in terms of SDG preferences. This indicates that the Dutch government can expect support from the national public for its SDG-related policies. The few preferences that do differ between both study groups, however, require attention. The Dutch government is advised to look into the relative rejection of SDG 17 by citizens, to find out what the main drivers are. Likewise, within its own organisation, the Dutch government is advised to look into the prioritisation of SDG 15 over SDGs 7, 8, and 9. For transparency purposes, it should be determined whether this prioritisation is the official government stance or not. After this, the cooperation with companies that do not benefit from a prioritisation over prosperity-related SDGs should be sought. Finally, the notion of loss aversion should not be overlooked. As the results suggest that citizens are more loss-averse in an SDG context than policy makers, the Dutch government can expect friction when implementing policies which cause a slight deterioration of a certain SDG. Thus, the finding can be used to reconsider such policy measures.

The findings also provide several opportunities for public education. The indicated absence of an effect of educational level on SDG preferences means that the Dutch government does not have to provide different levels of public SDG education information for groups of citizens with a different level of education. The fact that individuals' aid optimism level does have an effect on SDG preferences means that educating citizens about the positive effects of development aid can create more public SDG optimism. Also, the observed significant effect of citizens' SDG knowledge level on perceived SDG importance suggests that the government can enhance SDG support by educating citizens about what the SDGs actually are and how they are tackled. Within the policy maker group, the effects of perceived SDG complexity and SDG feasibility also provide opportunities for internal education. As both effects are strong, sceptics within the Dutch government can be made more enthusiastic by emphasising the practicability of the goals, and by debunking the fact that SDGs are too complex. This can create a more broad support within the Dutch government itself.

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List of Abbreviations

DCM	Discrete Choice Modelling
MDGs	Millennium Development Goals
RP	Revealed Preference
SDGs	Sustainable Development Goals
SP	Stated Preference
UN	United Nations
WtP	Willingness to Pay

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Chapter 1

Introduction

The concept of multilateralism – a coalition of three or more countries that strive for a common goal – has been around for over two centuries. It arguably made its debut during the Congress of Vienna in 1814, when European powers joined forces to regain peace and order after the downfall of Napoleon I (Brittanica, n.d.). However, the first modern appearance of a multilateral concord was the League of Nations, which was created after World War I and ended up being the precursor of the United Nations (UN) (United Nations Geneva, n.d.). Hereafter, many followed, amongst which the North Atlantic Treaty Organisation (NATO), the World Trade Organisation (WTO) and the European Union (EU). There are many proponents of multilateralism, who significantly favour the concept over unilateralism and bilateralism. They claim that multilateralism is the most effective way to address grand international challenges, and that multilateral organisations are better at providing information than unilateral or bilateral organisations, as information is regarded to be a collective good (Krause, 2004; Milner, 2006). Yet, as various academic scholars point out, the world is divided when it comes to the support of multilateralism; many question the efficiency and purpose of multilateral decision-making. Also, one cannot simply regard a multilateral organ as an entity in a vacuum. It always works together with both a national government and a national public, and the three are inseparably intertwined.

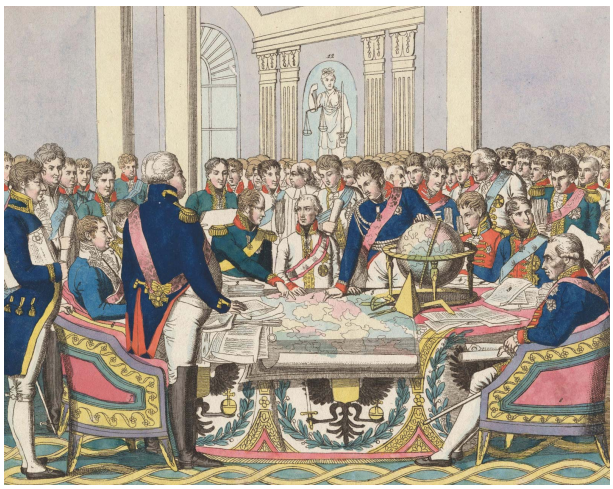


Figure 1.1: A watercolour of the Congress of Vienna by A. F. A. Campe (Campe, n.d.)

1.1 The dynamic policy triangle

The connection between government, multilateral organ and public presupposes single links between each of the three entities. First of all: the mutual relationship between a national government and its public. Most politicians and policy makers agree upon the belief that they have not been elected and appointed to solely form their own rationale behind certain policies, but that it is also their duty to give voice to the wishes of their citizens (Fishkin et al., 2000). Underlying this relationship is the phenomenon of political legitimacy, defined as "the quality of 'oughtness' that is perceived by the public to inhere in a political regime which is viewed as morally proper for a society" (Merelman, 1966, p. 548). Governments strive towards political legitimacy when looking to implement new policies, as this will ensure public consent and increase the policies' chances of success. Studies have shown that the opinion of the public has an influence on government policy, and that the strength of this influence relies on the salience of issues (Burstein, 2003). Although the opinion of the population is vocalised by interest groups and, in the case of a democracy, during elections or referendums, these inputs may be misrepresentative for the true public opinion (Fishkin, 2018; Fishkin et al., 2000). This illustrates the clear added value of public consultation by governments. According to research by Levitt, there are two predominant reasons to consult the public: either to discover what the public does not know, in order to correct the deficiency with government education, or to gather knowledge about what the public does know, to find out what experts can learn from these insights (2003). Additionally, substantive, normative and instrumental rationales exist for the consultation of the public. These involve, respectively, that it improves the quality of decision-making, that it is the 'right thing to do' in a democracy, and that it increases the chances of reaching predefined goals of certain policies (Mouter et al., 2020).

Secondly: the mutual relationship between a multilateral organ and a national government. The core concept in this connection is a phenomenon called collective legitimisation, defined as "an act by which legitimacy is attributed to national policy and other 'objects' by multilateral organisations" (Brewer, 1972, p. 73). As mentioned above, national governments seek political legitimacy when implementing new policies, and making decisions together with other nations collectivises this legitimising process. Because unilateral or even regional organisations are prone to domination by a single member, multilateral organisations have a greater legitimising capacity (Brewer, 1972). The extent of this legitimising capacity is dependent on the public opinion in a country. The range of activities for which collective legitimisation is accepted might be wide in one country, while being narrow in the other (Brewer, 1972). The size of the membership also plays a role in this acceptation; the greater the number of countries partaking in the multilateral organ, the greater the feeling that actions are based on a widespread moral accord (Brewer, 1972). However, unilateral organisations always remain attractive due to their efficient nature. In the United States, for example, policy makers have historically struggled with the trade-off between support of multilateral policies, which offer a generous collective legitimisation capacity, and unilateral policies, which tend to be more efficient and promising (Krause, 2004).

Thirdly: the mutual relationship between a multilateral organ and a national public. As mentioned, the legitimising capacity of multilateral organisations varies between countries and is

dependent on the public opinion. Academic scholars have shown that this public opinion is anything but unanimous. On the one hand, the concept of multilateralism is applauded. The public in many OECD countries have started to place more confidence in the performance of multilateral organs than in that of their national governments, and in Europe the dominant view is shared that multilateralism is the most effective way to structure international relations and to tackle grand global challenges (Krause, 2004; Milner, 2006). On the other hand, critical notes are added. Less than a majority of the American public is a supporter of multilateral cooperation regarding foreign aid, and the aforementioned general European support is accompanied with disagreement about the meaning, purpose and rationales behind multilateralism (Krause, 2004; Milner and Tingley, 2013). A similar difference of opinion exists for the specific case of the UN. Endorsing the UN is perceived as an opportunity for creating valuable possibilities. At the same time, it can be seen to put those nations involved at risk of aiding bad causes (Claude, 1966). Towards the end of the previous century, public opinion surveys showed that the evaluation of the UN's performance in dealing with problems varied between different countries (Millard, 1993). More recent research reveals that, while citizens are able to acknowledge the UN's general purpose and aims for peace and human rights, they remain sceptical about the effectiveness of UN policies and the solving of international problems (Bell et al., 2020; Holyk, 2010; Patrick, 2020).

When combining all these findings from academic literature, a schematic representation of the three-way relationship between government, multilateral organ and public can be established, and is presented in Figure 1.2. From here on, this relationship will be referred to as the dynamic policy triangle.

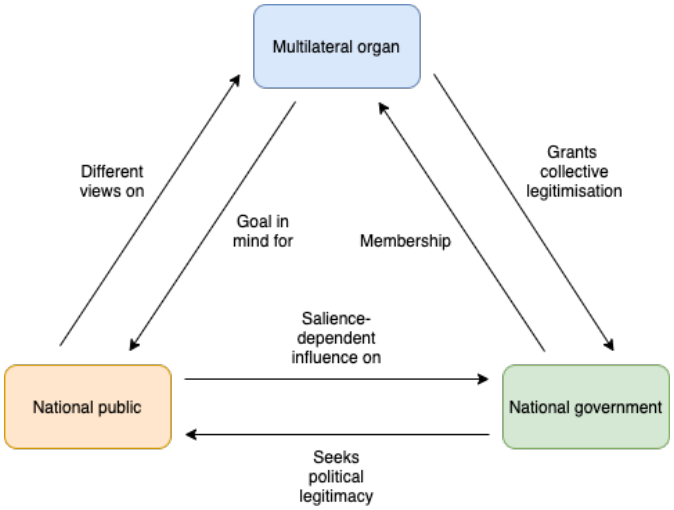


Figure 1.2: The dynamic policy triangle

The dynamic policy triangle is a vibrant political system, constantly changing due to academic insights and public debate developments. Despite the ample amount of research performed on different elements within the dynamic policy triangle, it remains an interesting and promising field of investigation. In particular, the role which a specific multilateral policy plays within the dynamic policy triangle seems unexplored.

1.2 The Sustainable Development Goals

An example of a large-scale and well-known package of policies is that of the UN's Sustainable Development Goals (SDGs). On Friday the 25th of September, 2015, the UN and its member states adopted the 2030 Agenda for Sustainable Development, which outlines multiple long-term, global goals for planet earth and its inhabitants (United Nations, 2015). After a large back-and-forth participatory effort of both the UN and national governments, and after the consultation of over ten million people from different parts of the world, seventeen SDGs were determined (Ghorbani, 2020). These goals, which are an extension of the previously constructed Millennium Development Goals (MDGs), provide a clear and measurable base to make significant progress in the economic, social and environmental dimensions of sustainable development (United Nations, 2015). Each goal focuses on a different challenge within these domains, and is made up of several targets and indicators. The targets, usually around ten per SDG, provide a division into different aspects involved in achieving the SDG. Subsequently, every target contains various indicators, which take on the form of quantitative statistics. For example: SDG 10, aiming to reduce inequality with and among countries, contains – amongst others – the target to adopt fiscal, wage and social protection policies to achieve greater equality. In turn, this target contains two measurable indicators: the labour share of GDP and the redistributive impact of fiscal policy (United Nations, 2021). By adopting the 2030 Agenda for Sustainable Development and by constructing both domestic and foreign policies around the seventeen SDGs, UN member states seem to possess a straightforward and measurable framework to tackle global grand challenges. Their leitmotiv: *leaving no one behind* (United Nations, n.d.-a). The SDG approach is meant to bring about sustainable progression for all nations, people and segments of society. Figure 1.3 shows a visual representation of the seventeen goals.

Figure 1.3: Overview of the seventeen SDGs (Telos, 2019)

1.2.1 An inevitable ordering of the SDGs

The SDGs, as presented by the UN, are considered a unity of goals, capable of influencing each other, and of equal importance (United Nations, 2015). In essence, no emphasis is placed on any one of the goals, and none of them is given priority over the others (Bali Swain and Ranganathan,

2021). However, according to scientific research, it is likely that such prioritisations *are* in fact made by UN member states at the national level (Allen et al., 2019). Although the setting of goals and indicators seems merely a straightforward and technical exercise, as implied in the previous paragraph, it is in fact a highly political one (Fukuda-Parr and McNeill, 2019). The degree of SDG adaptation and the importance which is attributed by member states' governments to certain goals, is dependent on the national political debate. The UN has based the SDGs on a specific understanding of sustainability and has intentionally let them heavily correlate with each other, allowing for mutual synergies and trade-offs. Yet, both the notion of sustainability and the interpretation of interlinkages amongst the goals differ at the national level (Barbier and Burgess, 2019; Breuer et al., 2019; Davidson, 2014; Tosun and Leininger, 2017). Additionally, uncertain times riddled with a raging COVID-19 pandemic, force countries with scarce resources to make certain difficult choices, as the deadline of 2030 is closing in fast (Asadikia et al., 2021). Despite the inevitability of prioritisation, shared information about the trade-offs between different SDGs made by governments is lacking. This forms a potential bottleneck, as clarity on these trade-offs is indispensable for the achievement of the goals (Herrero et al., 2021).

1.2.2 SDGs and the public opinion

As mentioned before, the public opinion has a significant influence on government policy, and an active consultation of this public can have multiple benefits for the quality and outcome of government decision-making. Additionally, in the case of long term goals and global challenges, public participation is not only desirable, but also necessary in achieving adaptation (Dlouhá and Pospíšilová, 2018). Especially when existing paradigms are questioned, as was the case with the introduction of the SDGs, synergy with the public is key for the transformational powers to fully work (Dlouhá and Pospíšilová, 2018; Hajer et al., 2015). One could therefore argue that governments should take into account the public opinion of the SDGs when formulating its SDG-related policies. However, little information exists about the public support of the SDGs at the national level (Guan et al., 2019). Despite the large number of pro-bono citizen initiatives and public debate discussions, which gives a rough indication of the public's views on the SDGs, this might not be representative for the entire population, as previously discussed. Besides, actual quantitative research on the topic of the public support of SDGs is lacking. Ergo, when it comes to the formation of SDG-related policies, national governments do not possess the means to consider the preferences of their citizens.

1.3 Research objective: the case of the Netherlands

The Netherlands, a country with roughly seventeen million inhabitants, was among the first group of countries that formed the UN. It was officially admitted in December 1945 (United Nations, n.d.-b). The political system in the Netherlands can best be described as a parliamentary democracy. Every four years, all citizens above the age of eighteen years are allowed to vote in elections that decide who will represent them in parliament. The Dutch parliament consists of the House of Representatives – 150 directly chosen representatives that design new bills and policy measures – and the Senate – 75 indirectly chosen representatives that approve or reject

the new bills and policy measures (Tweede Kamer der Staten-Generaal, 2018). Economically and societally the Netherlands is thriving, and according to the 2021 Happiness Report, it is the 5th happiest country in the world (Helliwell et al., 2021). The Netherlands is a high-income country, with a GDP of approximately €700 billion, and spends roughly €4.5 billion per year on development aid (Worldometer, n.d.). Relative to the gross national income, it is ranked 7th of all 29 DAC (Development Assistance Committee) countries in terms of development aid (OECD, 2020).

Being a UN member state, the Netherlands has also adopted the seventeen SDGs, and has consequentially started its participation via governmental policies and pro-bono activities (Centraal Bureau voor de Statistiek, n.d.-d; Lucas et al., 2016; SDG Nederland, n.d.). The SDG Nederland foundation has introduced a road map which sets out strategies to reach the goals in 2030, and the Dutch House of Representatives is informed periodically about their progress (Ministerie van Justitie en Veiligheid, 2020; SDG Nederland, 2020a, 2020b). In line with the mission of the UN, SDG-based domestic and foreign policies by the Dutch government are said to be built upon the notion of equality between all SDGs (SDG Nederland, 2020b). Recently, however, members of the Dutch opposition submitted a motion requesting more transparency about the policy choices made by the Dutch government regarding the SDGs, and about the extent to which these policies actually affect the progress of the SDGs (Tweede Kamer der Staten-Generaal, 2019). The motion was generously accepted. Adding to that, SDG Nederland and six umbrella organisations recently sent a letter to the former government, calling for a greater focus on the SDGs when it comes to the formation of development-oriented domestic and foreign policies (SDG Nederland, 2019). The question remains whether the Dutch government, as expected by academic scholars, prioritises certain SDGs over others, and if so, what this prioritisation looks like. In addition, little is known about the Dutch public opinion of the SDGs. Hence, the Dutch government formulates its SDG-related policies in a less transparent manner than desired, and is largely ignorant of the public views on the SDGs. To tackle this, consultation among the government's own policy makers and among the Dutch public should be performed. In this manner, it becomes clear how both Dutch policy makers and Dutch citizens think about the SDGs, and how the beliefs of these two groups relate to each other.

A failure to do this could form a problem for the Dutch government in the long term. Formulating governmental policies without specifically communicating which trade-offs have been made, and without knowing how the Dutch population thinks about these trade-offs, is politically unsustainable, harmful for the government's legitimacy and can, in the worst case, give reason to civil protests. It is especially critical in a time which many sources often describe as one in which the public is losing its trust in politics and democracy (Levitz, 2020; Lewsey, n.d.; Olusoga, 2020). Furthermore, when following the substantive rationale of public participation, stimulating citizen involvement can actually positively benefit the quality of decision-making, as ideas might arise which experts and policy makers had not yet thought of (Mouter et al., 2020). Thus, to prevent a loss of confidence and potentially improve the quality of decision-making, it is essential for the Dutch government that research is performed on the topic of the prioritisations of SDGs and the public support regarding them.

The goal of this research can be split up into three parts. First of all: gain insight into the prioritisations of SDGs made by both Dutch policy makers and Dutch citizens. Secondly: find an explanation for the individual prioritisations in those two groups and the relationship between them both. Thirdly: based on the research findings, formulate a fitting advice for the Dutch government with which it can speed up SDG progress.

1.4 Research approach and research questions

Because this research is an exercise in public consultation and an inquiry into priority-setting behaviour, the choice has been made to make use of Discrete Choice Modelling as the main research methodology. This method suits well with the direction of the thesis, and the arguments for this suitability are thoroughly discussed in Chapter 3. It needs emphasising that the issue of SDG priority-setting behaviour requires empirical research. Scholars have published about theories regarding the prioritisation of SDGs, but these theories have never been investigated empirically. To formulate a fitting advice for the Dutch government, conceptual theories about its own policy makers and about its citizens are not enough. The theories need acknowledging or debunking by empirical findings. Additionally, the theoretical literature remains at an abstract level, whereas a solid policy advice requires detailed findings. As mentioned, the literature speaks of the possible prioritisation of SDGs as a general concept. The empirical analysis in this research can determine whether this is in fact the case, but also to what extent and with which magnitude this is so. With these detailed findings, the policy advice for the Dutch government can become more specific, improving its feasibility and comprehensibility.

Keeping both the use of Discrete Choice Modelling and the empirical necessity in mind, the following main research question serves as guidance to adequately fill the aforementioned knowledge gaps and to achieve the research objective:

How do the preferences of Dutch citizens and Dutch policy makers with respect to the Sustainable Development Goals differ, and which factors could explain these preferences?

This main research question is addressed by answering the following sub-questions:

1. What aspects – related to the system of SDGs, sustainable development, development aid, and the phenomenon of prioritisation in general – could potentially influence the SDG preferences of Dutch citizens and Dutch policy makers?
2. How can the SDG preferences of Dutch citizens and Dutch policy makers (and all relevant factors potentially related to these preferences) best be measured?
3. Which estimated choice models correctly represent the SDG preferences of Dutch citizens and Dutch policy makers?
4. To what extent do Dutch citizens and Dutch policy makers prioritise certain SDGs, and to what extent do both study groups differ in their SDG preferences?
5. What are possible explanations for the individual SDG preferences of by Dutch citizens and Dutch policy makers and the mutual relationship between these preferences?

1.5 Societal and scientific relevance

Achieving the research goal is both societally and scientifically valuable. Societally, it provides information, on the one hand, to Dutch policy makers about the views their citizens have on the SDGs, which could potentially help these policy makers to construct more fitting and effective policy measures. On the other hand, it provides information to Dutch citizens regarding the views their national policy makers have on the SDGs; welcome information in times that some characterise by a loss of faith in democracy and government transparency.

Scientifically, it provides useful insights into the inner workings of the dynamic policy triangle. As mentioned, the dynamic policy triangle lives up to its name due to vibrant scholarly and public debates. Performing contemporary research of a multilateral policy package helps increase and retain understanding of the processes at work in the relationship between public, government and multilateral organ. Figure 1.4 shows how this research fits into the dynamic policy triangle. The bottom arm of the triangle is of interest – between national public and national government – and the red parts of the figure are the parts addressed in this research. Additionally, as has also been previously set forth, scholars have expressed the need for research into SDG prioritisations at the national level. This research hopes to heed this necessity. Finally, Discrete Choice Modelling has, up to now, never been used to measure SDG prioritisation behaviour. Therefore, it is not only a first for the use of empirical research regarding the topic of SDG priority-setting behaviour, it is also novel in the sense that the methodology has not yet been used in an SDG context before. Both factors can produce scientifically relevant findings.

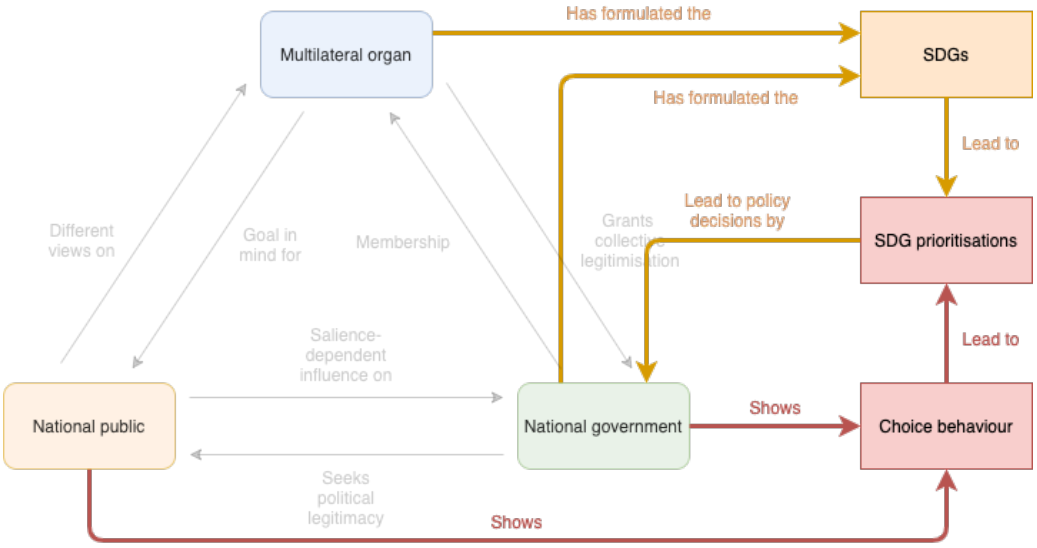


Figure 1.4: Scientific relevance within the dynamic policy triangle

1.6 Reading guide

This thesis document follows a clear and straightforward structure. It consists of seven chapters (including this one), all aimed at answering the five previously mentioned sub-questions. A visual representation of the research structure is shown in Figure 1.5.

Chapter 2 discusses the findings of an exploratory literature review, intended to better understand the SDGs and to discover aspects related to sustainable development and development aid that might influence Dutch citizens and policy makers regarding their SDG prioritisations. These aspects are then translated to the chosen research methodology in Chapter 3. This chapter also contains a detailed description of some of the key concepts of Discrete Choice Modelling, and critically argues for its suitability relative to other research methods. Chapter 4 describes the process of data gathering, including the survey design and the sample description. In Chapter 5, the gathered data is used to estimate choice models for both Dutch citizens and policy makers. The results generated by the choice models are analysed and interpreted in Chapter 6, and are finally used to form a SDG-specific advice for the Dutch government, which is explicated in Chapter 7. Chapter 7 also concludes the thesis and discusses several limitations, as well as ideas for future research.

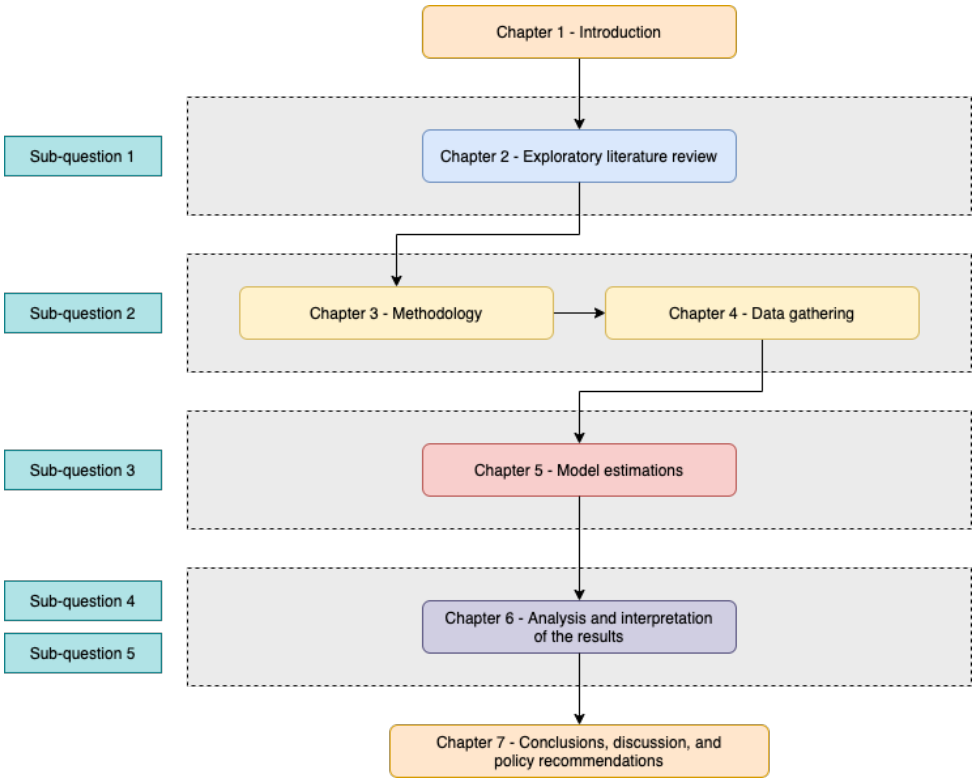


Figure 1.5: Visual representation of the research structure

Chapter 2

Exploratory literature review

Performing suitable and adequate research to gain insight into the preferences of Dutch policy makers and Dutch citizens regarding the SDGs requires a deep understanding of several key concepts. Besides thorough knowledge of the SDGs themselves, it is necessary to understand how goal progress is measured and to what extent the goals have been achieved in the Netherlands and in other countries. Also, it is crucial to understand theories underlying the SDGs: sustainable development and development aid. Finally, situational factors which vary between people and could potentially have an influence on preferences should be investigated. This chapter describes the findings of an exploratory literature review of these key concepts, and answers the first sub-question of this research: *what aspects - related to the system of SDGs, sustainable development, development aid, and the phenomenon of prioritisation in general - could potentially influence the SDG preferences of Dutch citizens and Dutch policy makers?*

2.1 A decomposition of the SDGs

"On behalf of the peoples we serve, we have adopted a historic decision on a comprehensive, far-reaching and people-centred set of universal and transformative Goals and targets" (United Nations, 2015, p. 3). This is one of the opening sentences of the 2030 Agenda for Sustainable Development; the UN resolution adopted by all member states in 2015. The 2030 Agenda introduced the seventeen SDGs, which were meant to act as a continuation of the previous MDGs, and were created to achieve what the MDGs did not. All seventeen goals were divided into a total of 169 targets, to break down the extraordinarily ambitious goals into more bite-size chunks (United Nations, 2015). In 2017, two years after the adoption of the SDG Agenda, the UN member states additionally agreed upon a further breakdown of the targets into indicators. These indicators enabled the measurement of SDG progress and made the goals more actionable (United Nations, 2017). The SDGs are built around five critical areas of sustainable development, referred to as the 5Ps (United Nations, 2015). These are the following:

- **People** – *all human beings can fulfil their potential without living in poverty and hunger.*
- **Planet** – *the planet is protected from degradation so that it can support the needs of current and future generations.*

- **Prosperity** – *all human beings can live prosperous lives due to economic, social and technological progress that is in harmony with nature.*
- **Peace** – *societies are peaceful, just, inclusive, and free from fear and violence.*
- **Partnership** – *means to reach the SDGs are mobilised.*

Each of the seventeen SDGs belongs to one of the 5Ps, as can be seen in Table 2.1.

Table 2.1: The 5Ps and the corresponding SDGs, based on OECD (2019)

People	SDG 1	*No poverty*
	SDG 2	*Zero hunger*
	SDG 3	*Good health and well-being*
	SDG 4	*Quality education*
	SDG 5	*Gender equality*
Planet	SDG 6	*Clean water and sanitation*
	SDG 12	*Responsible consumption and production*
	SDG 13	*Climate action*
	SDG 14	*Life below water*
	SDG 15	*Life on land*
Prosperity	SDG 7	*Affordable and clean energy*
	SDG 8	*Decent work and economic growth*
	SDG 9	*Industry, innovation and infrastructure*
	SDG 10	*Reduced inequalities*
	SDG 11	*Sustainable cities and communities*
Peace	SDG 16	*Peace, justice and strong institutions*
Partnership	SDG 17	*Partnership for the goals*

Another way of categorising the SDGs, is by moving away from the idea that economical, societal and environmental SDGs are seperate entities. Johan Rockström and Pavan Sukhdev, both linked to the Stockholm Resilience Centre, have proposed the so-called 'wedding cake', which presupposes that all SDGs are, in essence, connected to sustainability, biodiversity and healthy food. If this base is stable enough, society and the economy will be built upon this. Figure 2.1 shows the conceptual representation of this wedding cake.

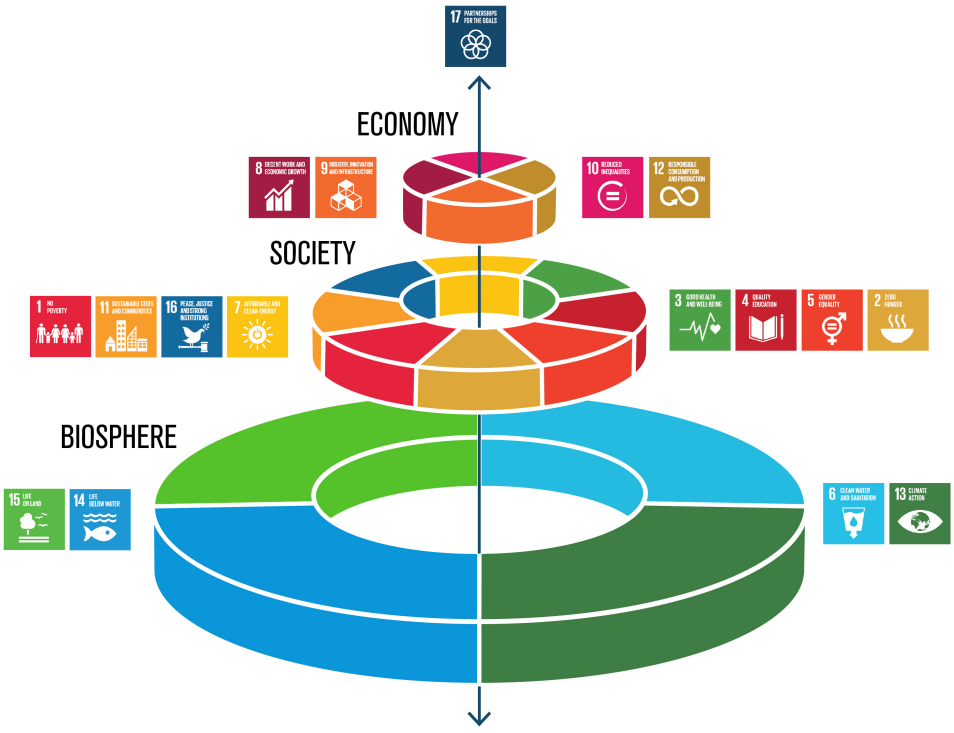


Figure 2.1: SDG wedding cake, developed by the Stockholm Resilience Centre

2.1.1 Progress measurement

Measurement of SDG progress is not a straightforward exercise. Not only do countries differ in their approaches regarding the selection of progress indicators – some countries decide to deviate from the UN's SDG indicators – the setting of target levels also varies between nations (OECD, 2019). As not all SDG indicators explicitly mention a target level, some improvisation is needed to determine the distance between countries' status quos and the desired states. Add to that the difficulty of missing or inadequate data, a common nuisance, and it becomes clear that SDG progress measurement is far from easy (OECD, 2019). However, various reports have been published by authors and institutions that take on this difficult task. These reports provide a satisfactory impression of the current state of affairs in different countries (OECD, 2019; Sachs et al., 2019; Sachs et al., 2020; SDSN and IEEP, 2019). The reports all use the official SDG indicators and, if predefined, their levels. In the case of non-determined indicator levels, these are established based on levels derived from science, from other international agreements, and from top performing countries.

According to the reports, the Netherlands is well on its way to achieve the SDGs. With an SDG Index score of 80.4, it is ranked 9th out of 193 countries in the world (Sachs et al., 2019; Sachs et al., 2020). Most distances to full achievement are small, if not zero, and are progressing in an upward trend. Viewed in a range from 0% to 100%, only five goals drop below the 75% mark, meaning they require attention: SDG 2, SDG 12, SDG 13, SDG 14, and SDG 17. SDG 1 is considered fully achieved. (OECD, 2019; Sachs et al., 2019; Sachs et al., 2020). Despite slightly

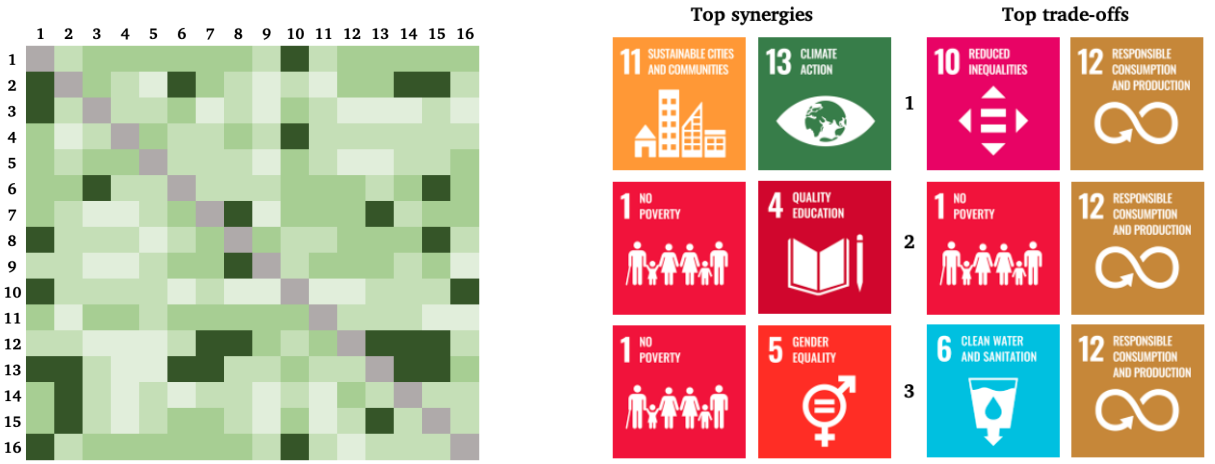
different conclusions, the report that is sent to the Dutch House of Representatives every year largely acknowledges the same areas of improvement and fulfilment (SDG Nederland, 2020b).

To highlight the amount of work that is still to be done globally, it is insightful to also look at a country in the Global South – for example: South-Sudan. South-Sudan is ranked 165th in the world, and shows low indicator scores for almost all SDGs. Although SDG 13 and SDG 17 are considered fully achieved, none of the other SDGs surpass the 75% mark, and most do not even pass the 50% mark. Little progress seems to be made, as most trends are labelled 'stagnating' or even 'decreasing'. And, to make matters worse, the raging COVID-19 pandemic has hindered all SDG progression even further, hitting poorest countries the hardest and turning back decades of work (United Nations, 2020a, 2020b). António Guterres, Secretary-General of the UN, propagates quick action "to turn the [COVID-19] recovery into a real opportunity to do things right for the future" (United Nations, n.d.-c, paragraph 1).

2.1.2 Interlinkages: synergies and trade-offs

Although the 2030 Agenda distinguishes 17 seperate SDGs, the total package is characterised by a high degree of interlinkage (SDG Nederland, 2020b). Some goals have a strengthening effect on each other, meaning that improvement of those goals leads to the improvement of other goals, while some have a cancelling effect, meaning that improvement of those goals leads to the deterioration of other goals. Despite an integrated policy approach being desired, understanding the interlinkages can help policy makers correctly prioritise goals (Bali Swain and Ranganathan, 2021; Scharlemann et al., 2020; Zhou et al., 2017).

The first scholars to suggest the investigation of SDG synergies and trade-offs advocated for a seven-point scale, ranging from *–3* to *+3*; from a cancelling interaction (a total trade-off) to an indivisible interaction (a total synergy). All SDG interactions, as proposed by the researchers, should be placed along this scale, which in turn could highlight areas suitable for prioritisation (Nilsson et al., 2016). Many research publications followed, mainly focusing on either a specific geographical region, or on a select set of SDGs (Bali Swain and Ranganathan, 2021; El-Maghrabi et al., 2018; Fader et al., 2018; International Science Council, n.d.; Koçak et al., 2019; Weitz et al., 2018; Zhou et al., 2017). Several researches, however, stand out because of their integral nature (Neumann et al., 2018; Pradhan et al., 2017; Scharlemann et al., 2020). These publications pinpoint the interactions between all SDGs. Despite showing different results due to differing research approaches, all three give valuable insights into the extent to which SDGs interrelate. Figure 2.2a shows a visual representation of all positive or negative interactions between the SDGs. The darker the shade of green, the stronger the (positive or negative) interaction between the SDG in the row and the SDG in the column. Figure 2.2b shows the three most prominent synergies and trade-offs between the SDGs. To clarify: an improvement of SDG 11 will also lead to an improvement of SDG 13, but an improvement of SDG 10 will lead to a deterioration of SDG 12.



(a) All interactions between the SDGs, based on Scharlemann et al. (2020)

(b) Three most prominent SDG synergies and trade-offs, based on Pradhan et al. (2017)

Figure 2.2: Academic analyses of SDG interlinkages

2.1.3 Criticism

The sheer amount of SDG interactions also provokes criticism, as it reveals the complexity of the 2030 Agenda, which in some people's eyes is *too* complex (Brand et al., 2021; The Economist, 2015). And the criticism does not stop there. At the time when the MDGs were still in use, these were already subject to diverse criticisms. Some regarded them too ambitious and unrealistic, while others berated them for being too narrow and not able to capture major development issues. Some disliked the minor role that developing countries had been given in the construction of the MDGs, while others warned for the danger of a lack of consensus when (too) many parties are involved (Fehling et al., 2013). This highlighted the difficult trade-off between complexity and feasibility. Additionally, the MDGs were deemed immeasurable, as their quantification was regarded irretrievably flawed (Attaran, 2005).

In the current day and age, since the MDGs have progressed and become the SDGs, critics continue to have their reservations. It all starts with general criticism of the notion of sustainable development. After all, the definition is fuzzy and can be different for everyone (Sultana, 2018). A professor from the University of Gent believes that the SDGs do not set in motion any structural paradigm changes, and that they contribute to a legitimisation of the current world order (Orbie, 2020). Mazijn, a colleague professor of his, agrees, adding the argument that the SDGs lack a thorough scientific foundation (Mazijn, 2020). And, in an online course provided by Trinity College Dublin on sustainable development, the author shares the beliefs that the SDGs do not go far enough, that they ignore underlying inequalities, that their top-down nature leads to ignorance of the local context, and that a lack of data makes measurement difficult (Trinity College Dublin, n.d.).

2.2 The concepts of sustainable development and development aid

According to the famous Brundtland report, published in 1987, the definition of sustainable development is: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, p. 41). It presupposes that present and future generations should not take up a dictatorial role in long-term societal choices (Chichilnisky, 1997). Development aid is defined as "aid expended in a manner that is anticipated to promote development, whether achieved through economic growth or other means" (Minoiu and Reddy, 2009, p. 7). Both concepts combined form the basis of the SDGs, and many governments' domestic and foreign policies are built upon them.

2.2.1 Dutch sustainable development and development aid policies

Policy measures of the Dutch government aimed at bringing about sustainable development and development aid, are, as in many UN member states, administered at both the national and the international level (Ministerie van Buitenlandse Zaken, 2015). Together with civil society, companies and knowledge institutions, an endeavour is made to engender domestic and foreign SDG progress (Ministerie van Buitenlandse Zaken, 2018; SDG Nederland, 2020b).

When it comes to domestic sustainable development policies, all Dutch ministries are responsible for incorporating this into their policy agendas. Foreign development aid policy, however, is the responsibility of the Minister for Foreign Trade and Development Cooperation; a ministerial post assigned to the Ministry of Foreign Affairs. In the most recent administration, changes were made in the approach to reach international SDG progress. The Ministry of Foreign Affair's policy note 'Investing in Perspective' contains a formulation of the plan for the coming years (2018). First of all, the focus of development aid has shifted towards a new set of unstable regions, videlicet: West-Africa, North-Africa, the horn of Africa and the Middle-East. When tackling poverty, migration, terrorism and climate change, the spotlight will be on these unstable regions. Secondly, several financial measures will be taken. For example, every year €60 million is made available for new educational and economic programs for younger generations, €290 million is put towards emergency relief and the reception of refugees in critical areas, and €80 million is invested in intensification of climate-related policies (Ministerie van Buitenlandse Zaken, 2018). The necessary financial transactions have different sources, amongst which company investments, income from national taxes, and philanthropic donations (Ministerie van Buitenlandse Zaken, 2015). In order to achieve the SDGs, the development aid budget should have reached a level of 0.7% of the Gross National Income by 2030 (Ministerie van Buitenlandse Zaken, 2018). The question remains, however, what the impact of the COVID-19 pandemic on development aid will be. After all, during economic crises, politicians tend to listen to public requests for a reduction of development aid (Heinrich et al., 2016).

2.2.2 Criticism

Unfortunately, also the notions of sustainable development and development aid are not spared from critical reflections. Sustainable development, as has been previously mentioned, is considered to have a fuzzy definition, making the interpretation different for everyone (Sultana, 2018). Development aid is met with even more criticism, and people are divided in their belief of the extent to which development aid actually succeeds (Jakupec, 2018). The official terms for this belief and disbelief are 'aid optimism' and 'aid pessimism', which represent the degree to which people consider development aid to contribute to growth in the global south (Askarov and Doucouliagos, 2015). Research has shown that three factors predominantly influence this degree: the amount of resources available to the government that administers the development aid, the cost of the development aid, and the actual gains caused by the development aid (Heinrich et al., 2016). However, it should be kept in mind that the public is generally ignorant when it comes to foreign aid policies and governmental budgetary situations.

Another point of criticism is the presence or absence of aid conditionality. Some people only accept development aid if rigid agreements are made pertaining to the use of the aid in the concerned developing countries, and to the financial pay-back structure (Apodaca, 2017). The opposite of aid conditionality would be debt relief, built on the belief that developing poor countries should not be making payments to developed rich countries (Temple, 2010). The crux of the matter is that development aid is a highly political issue, possibly missing the initial goal of the aid as a consequence. For instance, internationally focused parties tend to use development aid as a tactic to pursue certain opportunistic policy goals abroad. And, if the perspectives of the administering government and the recipient government contrast with each other, the aid is often used for unintended purposes by the recipient government (Apodaca, 2017). Although the EU is reluctant to adopt an attitude of development aid conditionality, research has shown that the majority of citizens actually *do* call for such an attitude (Bodenstein and Faust, 2017).

2.2.3 The domestic-foreign relationship

Governmental budget allocation is a topic which is not only heavily debated amongst policy makers, but also amongst citizens. One of the quandaries within this debate, having gained intensity with the rise of populist political parties, is the relationship between financial support for foreign development aid and financial support for domestic development aid. A classic, almost exhausted example of this debated relationship is that of former US president Donald Trump and his 'America First' ethos. During his administration, severe foreign aid budget cuts were made, and the idea of development aid was dismissed as a waste of money (Baron, 2018). US Democrats strongly disagreed. In the Netherlands, Geert Wilders' Party for Freedom expresses similar beliefs. The party frequently uses phrases as 'the Netherlands should be owned by the Dutch again', and 'the Netherlands should be ours again'. In the most recent party manifesto – the slogan being 'it is about you' – calls were made for an end to development aid, and an increase in health care, housing and national safety investments (Partij voor de Vrijheid, 2021). Once again, left-wing and/or progressive Dutch political parties disagreed with the proposed allocation.

These examples, of which many more can be found globally, expose a bigger bone of contention:

how should domestic and foreign spending be allocated, and can one speak of a trade-off in this context? Research has shown that countries that spend more domestically, also spend more on foreign aid (Kharas and Noe, 2018). Some people, however, express the wish that foreign development aid funds should be re-allocated to certain national focal areas, as these are of a higher level of urgency. Others see no rationale behind the idea that a trade-off even exists between the two (Green, 2012). In the context of the SDGs, the domestic-foreign relationship is an interesting and possibly critical notion. Although the common belief is that the Global South is the predominant target of the SDGs, the goals are as relevant for developed countries (Kharas and Noe, 2018). This brings up the vital question: do individuals value SDG-related domestic policies over SDG-related foreign policies (or vice versa), and if so, does this trade-off have an influence on their SDG preferences?

2.3 Situational factors

In addition to the previously discussed SDG characteristics, some individual-specific factors might also have an influence on people's preferences when it comes to their SDG preferences. These factors can be split into three categories – demographic, political and financial – and are displayed in Table 2.2.

Table 2.2: Situational factors that possibly influence SDG preferences

Demographic	**Political**	**Financial**
Gender	Ideological preferences	Willingness to Pay
Age	Knowledge of the SDGs	
Education		

Research has shown that many of the factors in Table 2.2 play a role in political voting behaviour. As has been illustrated in Chapter 1, the SDGs are of a highly political disposition. Also, they are based on various ethical principles, and the possible prioritisation of these ethical principles is likely to vary amongst people. It is therefore interesting to investigate whether individuals exhibit similar behaviour in their SDG prioritisations to the behaviour when trading off ethically grounded voting choices, and whether the variables in Table 2.2 have an influence on this behaviour.

There are two political factors which could have an effect on SDG preferences. Firstly: individuals' ideological preferences. It goes without saying that these preferences influence people's voting behaviour, but a likewise effect can be expected when it comes to the value people attach to certain SDG-related topics. For example, the extent to which the public opinion regarding foreign aid is unified, correlates with the degree of divisions between left and right; between liberals and conservatives (Risse-Kappen, 1991). Other ethical SDG considerations are also expected to depend on this political fragmentation. Secondly, the extent to which individuals are informed about the SDGs is likely to have an influence on their preferences. In general, as has already been

discussed, the public is relatively ignorant about governments' development aid policies, and this will likely entail different preferences than those of individuals who *are* informed (Heinrich et al., 2016).

Demographically speaking, three factors might be of influence on SDG preferences. First of all: an individual's gender; a topic which has already been thoroughly investigated. In the 1980's, the term 'gender gap' was coined, defined as the differences between males and females in electoral behaviour (Giger, 2009; Norris, 1996; Studlar et al., 1998). While the initial researches primarily observed the gender gap in the United States, in later years it was also detected in Europe (Giger, 2009). The reasons underlying the gender gap differ per country (Studlar et al., 1998). Secondly, people's age can have an effect. Studies have shown that the importance of voting and the ideologies behind voting differ per generation (Norris, 1996; Van der Brug, 2010). Finally, one's education is also expected to play a role. It is proven that, either directly or as a proxy for other factors, the level of education has an influence on political participation (Kolstad and Wiig, 2016; Persson, 2015). The same goes for ideological preferences: different age groups tend to exhibit different political choice behaviour (Holland, 2013).

Financial drivers also have a plausible influence on SDG preferences; to be specific: an individual's 'Willingness to Pay' (WtP). This concept – an expression of interest or preference for certain goods, services or other aspects of life – is a "measure of the 'marginal benefits' enjoyed from consuming more" (Scheufele and Bennett, 2019, p. 49). At the basis of this phenomenon is the assertion that individuals' welfare changes can be valued by what they are willing to pay for those changes (Markandya and Ortiz, 2011). Prior research has been performed on WtP levels concerning climate change adaptation, but so far as is known no research has been performed on the WtP levels with regard to the SDGs, and on possible variation of these levels between individuals (O'Garra and Mourato, 2016).

2.4 Conclusions

The exploratory literature review has yielded various factors that are related to the package of SDGs, to the concepts of sustainable development and development aid, and to individual-specific characteristics. It is possible that these factors play a role in the SDG preferences of Dutch policy makers and Dutch citizens. In the following chapters, the analysis performed to find out these possible influences is explained. The main points which have been discovered during the exploratory literature review are summed up below.

- Each of the seventeen SDGs belongs to one of the 5Ps: **People, Planet, Prosperity, Peace and Partnership**.
- Countries utilise different methods of SDG progress measurement. The most common way is to express this progress using **a percentage**.
- **The SDGs are strongly interlinked**; some forming synergies, others forming trade-offs. Although an integrated policy approach is desirable, **a good understanding of the**

interlinkages can help policy makers prioritise the SDGs correctly.

- Some of multiple well-known points of criticism regarding the SDGs are: that they are **too complex**; that they are **not feasible**; that they **lack scientific founding**.
- **The COVID-19 pandemic** has had a **negative effect** on SDG progress.
- **All Dutch ministries** are responsible for incorporating **domestic sustainable development** into their policy agendas. **Foreign development aid policies** by the Dutch government are the responsibility of the **Minister for Foreign Trade and Development Cooperation**.
- Some of multiple well-known points of criticism regarding sustainable development and development aid are: the **definition** of sustainable development is **fuzzy**; development aid does **not contribute to growth** in developing countries; development aid is **not conditional enough**.
- The governmental budget allocation quandary when it comes to **domestic policy versus foreign policy** is heavily debated.
- Several situational factors have an influence on individuals' (political voting) behaviour, and it is relevant to investigate whether similar findings occur in the domain of the SDGs: **gender**, **age**, **education**, **ideological preferences**, **knowledge of the SDGs**, **WtP**.

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Chapter 3

Methodology

It was Aristotle who, around 340 BC, wrote in his Nicomachean Ethics that *"it is our choice of good or evil that determines our character, not our opinion about good or evil"* (Aristotle, 1997). Although written millennia ago, his wise statement is all the more relevant today, especially in the domain of public consultation. Nothing reflects people's true conceptions of certain topics as much as the choices they make in topic-related situations. In the case of SDG prioritisations, it is therefore useful to look into the choices that Dutch citizens and Dutch policy makers make when confronted with SDG-related situations. This chapter contains an explanation of the chosen research methodology: Discrete Choice Modelling within a survey. Its suitability is delineated relative to other methods, several underlying theoretical concepts are clarified, and the conclusions drawn from the exploratory literature review in Chapter 2 are translated to the methodological theory. Together with Chapter 4, this chapter provides an answer to the second sub-question of this research: *how can the SDG preferences of Dutch citizens and Dutch policy makers (and all relevant factors potentially related to these preferences) best be measured?*

3.1 Methods of public consultation

There are numerous methods which have been created for the purpose of public consultation. James Fishkin, a leading professor of political science, distinguishes eight of them, as can be seen in Table 3.1. The two main differing characteristics of these methods are the process of respondent selection and the desired level of the public opinion; raw or reformed (Fishkin, 2006).

Table 3.1: Eight forms of public consultation, based on Fishkin (Fishkin, 2006)

		Method of selection			
		Self-selection	*Non-random sample*	*Random sample*	*'Everyone'*
Desired level of public opinion	*Raw public opinion*	Self-selected listener opinion polls	Surveys	Surveys	Referendums
	Refined public opinion	Discussion groups	Citizens' juries	Deliberative polls	'Deliberation Day'

Naturally, opinions are divided when it comes to the desired level of public opinion. Generally speaking, citizens are said to be uninformed with respect to most complex policy affairs (Fishkin, 2006). The reason for this is a phenomenon called 'rational ignorance', which means that citizens do not believe their individual votes have a significant influence amongst millions of others, and therefore rationally choose not to inform themselves on relevant policy topics (Fishkin et al., 2000). This is usually seen as a reason to desire the refined public opinion, and not the raw public opinion, as the raw public opinion is generally uninformed. However, it is a fact that the public is made up of diverse groups, each with differing viewpoints. It should not be idealised as a beacon of truth and morality (Levitt, 2003). One could thus say that the true public opinion is reflected in the raw, unrefined public opinion. Additionally, as mentioned in the introduction in Chapter 1, there are two reasons to consult the public: either to see what the public *does not* know, or to see what the public *does know* (Levitt, 2003). Both notions hold true when it comes to the raw public opinion; the unrefined opinions offer information about what citizens are not informed about, providing opportunities for public education, and about what citizens actually are informed about, presenting experts with possibly unknown knowledge. In the case of this research, where little information is available about the public views on the SDGs, but where the public is given a large role in the adaptation of the goals, it is relevant to understand how Dutch citizens view the SDGs without any additional deliberation; raw and uninfluenced.

For this research, the choice was made to use surveys for the consultation of the Dutch public [1]. The survey is web-based, which affords several benefits. It makes for a fast and easy collection of data, and is lower in cost than, for example, personal interviews (Heiervang and Goodman, 2011). Large populations are approached with relative ease, and these populations will likely be more candid with their responses, as the method can guarantee anonymity of the responses

[1] Besides consulting the Dutch public about the SDGs, this research also consults Dutch policy makers about the same topic. To be able to easily compare the results between both groups, and because the population of Dutch policy makers consists of many people, the choice has been made to use the survey methodology for both consultation processes.

(Jones et al., 2013; SurveyMethods, 2011). Simple random sampling is taken as a basis, in which every Dutch citizen has an equal chance of being included in the survey sample (Taherdoost, 2016). However, due to the fact that it is not within the capabilities of this research to have access to the entire population – as is a requirement of simple random sampling – the method cannot be performed correctly. To overcome this, convenience sampling and snowball sampling are used. Convenience sampling allows respondents to be selected that are easily and readily accessible, and snowball sampling allows respondents to encourage other population members to take part in the survey (Taherdoost, 2016). Combining these methods fits within the capabilities of this research and reduces sampling error (Wiśniowski et al., 2020).

3.2 Suitability of Discrete Choice Modelling

As mentioned in the introduction of this chapter, it is interesting to look into the preferences that Dutch citizens and Dutch policy makers show when it comes to their views on the SDGs. Because the package of SDGs consists of many goals which have a high degree of interlinkage, respondents might find it difficult to answer direct questions about their opinion of them. This is why, within the surveys, the methodology of Discrete Choice Modelling (DCM) predominates. This methodology is aimed at understanding the behavioural process that underlies an individual's choice (Train, 2003). Respondents are asked to view an amount of so-called choice sets (information about which will follow in section 3.3) and to choose their preferred option in of each of them. Because each set contains a finite number of distinct options, the choice situations are referred to as discrete choice problems (Glasgow and Alvarez, 2008). Despite mainly being used for labour market or travel mode situations, the method has also proven effective in the political arena (Glasgow, 2001; Glasgow and Alvarez, 2005). Additionally, DCM is suitable for priority-setting situations like in the case of this research, and is preferred relative to other methods in which respondents are asked to assign weights to certain aspects. The reasons for this are that DCM forces respondents to review some difficult trade-offs between characteristics, and that individuals are accustomed to making choices in specific scenarios, rather than carrying out experimental ranking and rating exercises, as choice-making is something they do on a daily basis (Farrar et al., 2000).

A good alternative to DCM, one which is also displayed in Table 3.1, is a method called deliberative polling. Deliberative polling involves respondents answering an initial survey, then spending a weekend of deliberation and discussion together whilst being informed on the survey topics, after which they take the same initial survey again to see the differences. The clear benefit of this method is that the researcher gets to know how an educational session influences people's opinions of certain topics. While deliberate polling could be a suitable option in this research, the method of DCM presents some distinct advantages. Both methods require a large sample, and for DCM in a survey this is easier to acquire than with deliberative polling, given this research's financial constraints (Fishkin, 2006; Fishkin et al., 2000). Additionally, DCM is a pure representation of people's opinion. Following Aristotle's rationale in the opening paragraph of this chapter, the actual choices that individuals make on a given topic more adequately represent their opinion than oral statements do. DCM is capable of measuring this choice behaviour. Finally,

DCM is able to pick up subtle effects, and quantifies aspects of choice behaviour that would otherwise not be recognised using other methods. Where other methods would ask respondents to state their SDG preferences qualitatively, DCM can express prioritisations in magnitudes, presenting the researcher with more information. With quantitative data, it becomes possible to investigate to what numerical extent certain effects and preferences occur, and this improves the usability of the research findings for policy advice.

DCM is a methodology that stems from behavioural economics and psychology, and is based on the notion that an individual's choice of a certain option relies on his or her preferences for specific options. It is the task of the researcher to find out what factors influence these preferences (Hensher et al., 2005). DCM allows for this, as it has the capacity to incorporate multiple factors in multi-dimensional choice situations (Knudsen and Johannesson, 2019). This is valuable in the case of this research, as the trading-off between SDG-related affairs is in essence a moral exercise. Moral choice situations are usually characterised by a multiplicity of factors, making the use of DCM suitable (Chorus, 2015). These factors may deviate heavily across an entire population of individuals; there is a large amount of variability – heterogeneity, as this is called in DCM – in the reasoning behind individual decision-making. Some of this heterogeneity can be captured by the researcher (observed heterogeneity), and some cannot (unobserved heterogeneity), either because the factors in question are known but cannot be measured, or because no information about the factors exists. Ultimately, it is the goal to maximise the observed heterogeneity, and to minimise unobserved heterogeneity (Hensher et al., 2005).

3.3 Theoretical embedding of DCM

Before the SDG-related aspects of the exploratory literature study can be translated to the methodological language, several key concepts of DCM require thorough explanation. Videlicet: the notions of attributes, utility maximisation, choice sets, weights, Stated Preference and Revealed Preference. This section provides these explanations.

3.3.1 Key concepts

As has been previously mentioned, within every choice situation there is an amount of observed and unobserved influences that shapes an individual's choice behaviour. In DCM, this phenomenon is expressed as the set of attributes that is the source of utility (Hensher et al., 2005). Two terms should be defined here. Firstly: attributes. It is assumed that an individual's choice is not formed by the actual alternatives, but by the characteristics (attributes) of the alternatives (Wittink, n.d.). The individual (possibly unconsciously) applies a certain decision-making rule, in which the attributes involved in the choice situation are used to select the preferred option. This is where the second term comes in: the level of utility. This term originally comes from economics, and in psychology it is referred to as the level of satisfaction (Train, 2003). It is built upon the belief that each choice made by an individual yields a certain level of satisfaction/utility. When this individual is presented (either artificially or in real-life situations) with the choice between several options – alternatives, as they are called in DCM – he

or she will prefer the alternative that yields him or her the maximum level of utility, and will choose accordingly (Hensher et al., 2005; Wittink, n.d.). DCM enables the quantification of this utility maximising behaviour. In its simplest form, utility can be quantified as the following:

$$U_i = V_i + \varepsilon_i \tag{3.1}$$

where:

U_i = total utility obtained from alternative i

V_i = observed utility obtained from alternative i

ε_i = unobserved utility obtained from alternative i

All the theory above comes together in choice sets. In a choice set, an example of which can be seen in Figure 3.1, individuals are asked to choose between a finite set of mutually exclusive and exhaustive alternatives (Train, 2003). In these alternatives, several attributes which are believed to have an influence on the choice behaviour of individuals are varied. In Figure 3.1, the attributes are x_1, x_2 and x_3, and vary over alternatives i, j and k. The attributes each have their own set of levels. For every alternative, the value of the attributes is set to one of these levels. As an example: in alternative i, attribute x_1 is set to the level of $x_{1,i}$. It is up to the decision-maker to decide which of the alternatives has his or her preference.

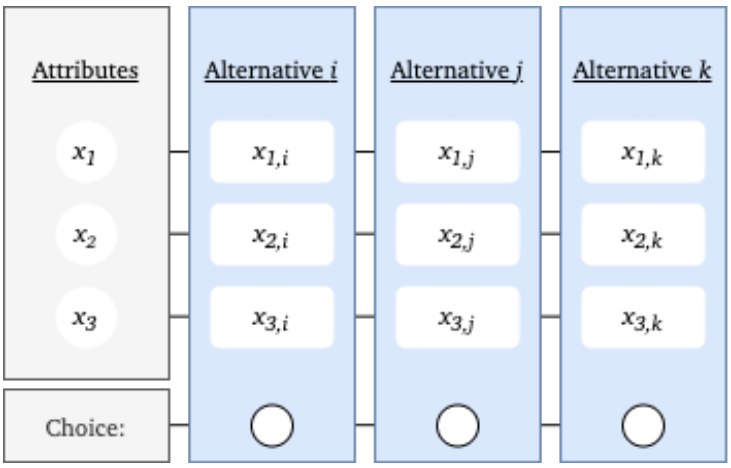

Figure 3.1: Example structure of a DCM choice set

Attributes x_1, x_2 and x_3 complete the observed utility V_i, and all factors not included in Figure 3.1 make up the unobserved utility ε_i. In its simplest form, the utility that is associated with alternative i can be quantified as follows:

$$V_i = \beta_{0,i} + \Big(\beta_{1,i} * f(x_{1,i})\Big) + \Big(\beta_{2,i} * f(x_{2,i})\Big) + \Big(\beta_{3,i} * f(x_{3,i})\Big) \tag{3.2}$$

where:

V_i = observed utility obtained from alternative i

$\beta_{0,i}$ = alternative-specific constant for alternative i

$\beta_{1,i}$ = the weight attributed to attribute 1 in alternative i

In Equation 3.2, $\beta_{1,i}$, $\beta_{2,i}$ and $\beta_{3,i}$ represent the weights – in DCM called parameters – attributed to the according attributes. They establish the relative contribution of every attribute to the observed utility (Train, 2003). In other words: they show the relative importance of each attribute in the satisfaction obtained from an alternative by an individual.

3.3.2 Stated Preference and Revealed Preference

DCM can be applied using two types of data: Stated Preference (SP) data and Revealed Preference (RP) data. RP data "represents data collected on choices that are made in an actual market" (Hensher et al., 2005, p. 92). It bears the closest resemblance to real choice behaviour, as the choices that are collected are actual choices, made in real-life situations. For the case of this research, RP data could include: official government statements that indicate which SDGs are prioritised or which are explicitly not, national budgets with clear-cut SDG allocations, or citizen questionnaires. Many of these, however, are not available or do not exist, or do not provide enough variation in the attributes of study to confidently make statistically sound statements about citizens' and policy makers' SDG choice behaviour.

This is where SP data comes in, defined as "the choices 'made' or stated given hypothetical situations (Hensher et al., 2005, p. 96). SP can be used when the attributes of interest are not varied in the real world, or are in general not even observed in the real world (Mark and Swait, 2004). It presents the opportunity of investigating non-existent strategies or alternatives, to find out how respondents would react to them. This hypothetical nature also has a downside: it entails the risk of hypothetical bias. The implication of hypothetical bias is that respondents will not choose in the same manner as they would in real-life situations. Or, as Hensher et al. describe this phenomenon: "sure, I'll take two Ferraris" (2005, p. 96). Because SP is prone to this type of bias, it is imperativef that the choice modeller makes the SP choice experiment as close to real life as possible. More on the notion of hypothetical bias can be found in Chapter 7.

For this research, the choice has been made to use SP data. After having searched through government documents, no information on Dutch government choices regarding the SDGs was found. For Dutch citizens, the same applies. This makes the use of RP data difficult. SP data enables a wide variety of scenarios and will allow a large variation of attribute levels. It will also allow for the investigation into background variables that possibly influence SDG preferences.

3.4 Translation of SDG concepts to the DCM language

In Chapter 2, multiple concepts were found in existing academic and government literature that are part of the system of SDGs or possibly influence citizens' or policy makers' SDG preferences. The entirety of this collected information is large in size, which makes it desirable not to include

all factors in the research survey. Respondents have a limited attention span, and, in the case of policy makers, have little available time for the participation in a thesis survey. For the sake of data collection, it is therefore beneficial to include only a subset of the entire amount of factors. This section describes which elements from the literature review are included in the survey, and how these are translated to the method of DCM.

For the selection of attributes – the factors that will be varied within the choice sets to find out how respondents react to changes of these factors – only the four most important aspects from the literature will be included:

- **The change in SDG achievement**, to determine how individuals value the improvement or deterioration of each SDG
- **The location of SDG action**, to determine whether individuals make a distinction in SDG improvement or deterioration between different locations
- **The current level of achievement of an SDG**, to determine whether individuals make a distinction in SDG improvement or deterioration between SDGs that are achieved to different levels
- **The cost of SDG action**, to determine what individuals are willing to pay for SDG improvement of deterioration

First and foremost, a variable is needed with which SDG preferences can be measured. By varying the extent of a change in SDG achievement, it will be possible to derive individuals' value of such a change. By measuring these values for all seventeen SDGs, a comparison can be made between them. Essentially, this is how SDG prioritisations are acquired. To deepen the understanding of these SDG preferences and to make the information that can be deduced from the experiment more voluminous, two other aspects of SDG change are included. Literature has shown that the current situation of the goals varies per SDG and per country. This raises the question: do individuals value SDG change in one location more than in the other? And: do individuals value change of an SDG that is achieved for 20% more than one that is achieved for 80%? The variation of two attributes – one for the location of SDG change and one for the current level of achievement of the SDG that changes – will give insight into these matters.

Besides the attributes, there are several so-called background attributes that are not varied in the choice sets, but that might have an influence on the choices that individuals make. These background variables relate to citizens' demographic characteristics or citizens' and policy makers' opinions regarding the SDGs, and regarding the notions of sustainable development and development aid. The background variables that are included in this research are the following:

- Citizens' **gender**, **age**, **educational level**, and **political preference**
- Citizens' **level of knowledge of the SDGs**
- Policy makers' view on the **complexity of the SDGs**, on the **feasibility of the SDGs**, and on **whether the COVID-19 pandemic is believed to have an influence on Dutch governmental policy**

- The level of **development aid optimism** and the desire for **development aid conditionality**
- The **position in the domestic-foreign trade-off**

Due to the aforementioned limited time span and available time of both study groups, not all background variables are gathered for both of them. For instance, as it is not relevant to know the demographic characteristics of policy makers (given that policy makers will fill in the survey from their professional perspective), these variables will only be gathered from citizens. The same goes for the level of SDG knowledge – the assumption is made that asking policy makers about their knowledge level concerning the SDGs is redundant. On the other hand, the extent to which individuals believe in the complexity and feasibility of SDGs, is something that is especially interesting for policy makers. It is assumed that citizens (on the whole) do not know the SDG well enough to be able to estimate both factors. The other matters – the level of aid optimism and conditionality, and the position in the domestic-foreign trade-off – will be investigated for both study groups, and compared between the two.

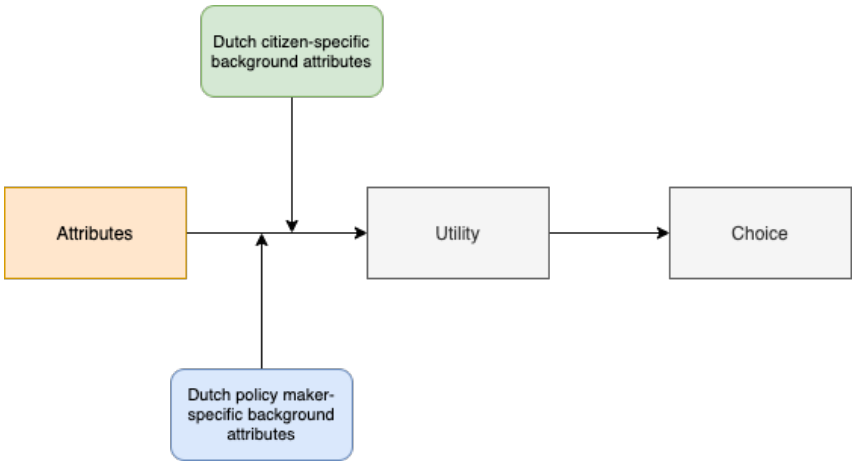

Figure 3.2: Conceptual representation of SDG choice behaviour

The selection of attributes and background attributes form the basis with which the DCM experiment and survey can be constructed. Figure 3.2 shows how all the elements relate to the utility of individuals, and how this leads to a certain choice. In the next chapter, Chapter 4, the translated concepts will be shaped into a DCM experiment.

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Chapter 4

Data gathering

To enable the analysis of citizen and policy maker preferences, it is imperative to gather a significant amount of data from both study groups. In chapter 3, the chosen use of DCM was substantiated, and the related elements found in chapter 2 were translated to this methodology. This chapter contains an elaboration on the design of the survey used to collect respondent data, a detailed description of the two study group populations and how these were sampled, and descriptive information about the sampled respondents. Together with Chapter 3, this chapter provides an answer to the second sub-question of this research: *how can the preferences of Dutch policy makers and Dutch citizens (and all relevant factors potentially related to this behaviour) best be measured?*

4.1 Survey design

Constructing the survey used for the gathering of data from Dutch citizen and Dutch policy makers requires several crucial considerations. For the DCM part, the attributes need to be broken down into levels; it should be determined how many alternatives are included; and the generation of choice sets demands a clear structure and set of rules to be applied. For the non-DCM part, it must be established which information is desired and how this information can best be gathered. This section contains a detailed account of these necessities.

4.1.1 Attribute level selection

As mentioned in Chapter 3, the experiment contains four attributes: the change of an SDG, the location of an SDG change, the current situation of an SDG, and the cost of an SDG change. Each of these attributes is divided into an amount of levels, which will be used to ensure variation in the generated choice sets. An important factor to take into account, is a notion called 'attribute level balance', defined as "the requirement that the levels of an attribute occur with equal frequency" (Huber and Zwerina, 1996, p. 309). To assure attribute level balance, it is necessary to create the same multiple of levels for each attribute. For example: an attribute with three levels and another with five will not allow for attribute level balance. An attribute with two levels and another with four, however, will do so.

For the first attribute – the change of an SDG – the levels are expressed in percentage point

changes. As discussed in Chapter 2, the most common manner of indicating SDG progress is by using percentages. Consequently, the easiest and clearest way of conveying changes in this achievement is by using *percentage points*. Using percentages here would be cause for confusion, as the change is relative to the current situation; another attribute in the experiment. This current situation attribute is expressed using *percentages*. If the change attribute would also contain levels using percentages, respondents could be in doubt about the actual change. For example: a 20% increase relative to a current achievement of 40%, results in a new situation of 50% achievement. Using percentage point would make this situation much easier: a 20 *percentage point* increase relative to a current achievement of 40%, results in a new situation of 60% achievement. For respondents, this is easier to calculate and therefore the preferable option. As for the actual level values of both attributes, the choice was made to use minus or plus 20 percentage point as the maximum changes. As mentioned, it is key to create scenarios that are as likely as possible, to minimise hypothetical bias. It is expected that an SDG will not change by more than 20 percentage point in one go. The current SDG situation attribute was fitted accordingly – outer bounds of 20% and 80% were chosen to ensure that the current situation will not go under 0% or over 100% after the SDG change.

Levels for the location of SDG change have intentionally been kept limited. The purpose of the attribute is to find out whether individuals value SDG change differently in different locations, especially between the own country and countries in need. Therefore, the choice was made to limit the attribute levels to two nominal values: the Netherlands and the Global South. More on the effects of this choice can be found in Chapter 7. As for the cost attribute, it should be noted that the goal of this attribute is to find out how much individuals are willing to pay. To achieve this, respondents have to feel that the costs that are attached to SDG change, are costs that concern them directly. Therefore, the cost attribute is designed as a tax increase attribute; the amount of extra tax payments respondents have to make on a yearly basis. In reality, the SDGs are not only financed by tax payers, but also by means of trade agreements and philanthropic donations from companies and individuals (Ministerie van Buitenlandse Zaken, 2015). Email contact with policy makers from the Dutch Ministry of Foreign Affairs acknowledges this fact. While this research respectfully takes this into account, the choice sets approach the situation as if all costs have to be made with tax payments, to be able to capture what respondents are truly willing to contribute to SDG change. The attribute level values have been determined by calculating (using a back-of-the-envelope estimation) the financial means required from the average Dutch tax payer in order to fully achieve two of the seventeen SDGs [1]. A detailed account of how this back-of-the-envelope calculation was made, can be found in Appendix A. The attribute levels were positioned around the estimate, in order to find out how people would react to lower or higher values than the (approximately) realistic value.

Figure 4.1 shows all attributes and their levels. It should be noted that the first three attributes – change, location and current situation – are repeated for all seventeen SDGs. If this would not be the case, it would only be possible to investigate the preferences regarding one single SDG. As

[1] The fact that two SDGs were chosen to calculate the required financial means is due to the DCM experiment setup in which two SDGs figure. More on the DCM experiment setup can be found in Section 4.1.3

the research objective is to find out preferences concerning all seventeen SDGs, the attributes are repeated for all the goals. Appendix B.2 contains a list of all attributes used in the DCM experiment.

Table 4.1: All attributes and their levels

Attributes	**Levels**			
SDG change	*-20 pp*	*-10 pp*	*+ 10 pp*	*+ 20 pp*
SDG location	The Netherlands		Global South	
Current SDG situation	*20%*	*40%*	*60%*	*80%*
Tax increase	*€150*	*€250*	*€350*	*€450*

4.1.2 Selection of alternatives

After having determined the attributes and corresponding levels, the last thing necessary to generate choice sets is to establish the desired (number of) alternatives. In common applications of DCM experiments, the alternatives are used to distinguish modes of transport or different products or product types. After the data has been collected, it then becomes possible to calculate the market share of an alternative by analysing the amount of times respondents chose for that alternative. For this research, however, this situation does not apply. Rather, what is of interest here are the effects of varying the SDG attributes. Given the fact that the Dutch government implements policies that attempt to undertake SDG action, the choice was made to use three possible policy packages as alternatives in the choice sets. It can then be deduced from the respondents' choice of policy package (alternative) which aspects these respondents deem important.

An important consideration is the in- or exclusion of a so-called 'opt-out alternative'. This is an extra alternative in which respondents get the opportunity to not choose any of the other alternatives. In the case of this research, this would be an alternative stating that none of the three policy packages are preferred. It is well-known that excluding such alternatives might lead to errors in policy recommendations (Campbell and Erdem, 2019). Respondents have no other choice than to accept one of the three alternatives, when in reality they might dislike all three. However, the amount of reasons why respondents choose such an opt-out alternative are legion. Consequently, the amount of possible analyses are also extensive, making it difficult to know which to choose. Campbell and Erdem affirm that researches aimed at estimating attributes' marginal rate of substitution and at comparing attributes with each other do not necessarily require an opt-out alternative (2019). Therefore, the choice was made to exclude such an alternative from this research. Nonetheless, the exclusion of an opt-out alternative does have its downsides. These are discussed in the limitations in Chapter 7.

In the survey, respondents were shown the following text, with which the alternatives were put into context:

Together with all other UN member states, the Dutch government has decided to invest in global SDG progress. All governments together are considering three different policy packages, which should be funded using tax money from all UN member states. The three policy packages affect two SDGs, which either show an improvement or a deterioration compared to the current situation. The policy packages differ in approach from each other and as a result also cost different amounts of money. The question to you is: which policy package do you prefer?

4.1.3 Choice set generation

With the determination of attributes, levels and alternatives, it is possible to generate choice sets. For commonly used DCM experiment setups, the generation of choice sets happens via a program like *Ngene*, which automatically generates a carefully constructed design of sets. However, for the DCM experiment in this research, this was not a possibility. Because not every attribute from the total list of attributes in Appendix B.2 is used in a choice set (the explanation for this follows below), a standard design is not applicable. Therefore, several self-constructed coding blocks in Python were used for the generation. Because these lengthy blocks of code are not included in this thesis, this section contains a concise description of the process that was followed, and of which rules were applied.

Each choice set contains two SDGs that change. The reasoning behind this is that it is practically impossible for respondents to review SDG change for all seventeen goals. In addition, given the fact that the alternatives are policy packages implemented by the Dutch government, it is highly unlikely that these packages would influence all seventeen SDGs at once. For each choice set, two random SDGs are selected, whilst ensuring that the same SDG is not chosen twice. Because only two SDGs vary per choice set, the total amount of choice sets need to be large to ensure enough choice data per SDG. In total, 100 variants of 10 choice sets (in total 1000 choice sets) have eventually been generated, with each SDG appearing approximately the same amount of times. The exact amounts of SDG appearance can be seen in Appendix B.3.

After having selected the two SDGs, corresponding SDG locations, current SDG situations and SDG changes per policy are randomly selected from the available attribute levels. It should be noted that the location of SDG change and the current SDG situation do not vary for each policy package (alternative). The current SDG situation is modelled as was done by Huang, Van Cranenburgh and Chorus in their DCM experiment setup (2020). An example of a generated choice set can be seen in Figure 4.1. It is good to mention that the SDG change attribute, expressed in percentage point changes, is not portrayed as such in the visual choice sets presented to respondents. For clarity, the choice was made to display them as the eventual situation, given the current situation and after the change. In the example seen in Figure 4.1, the change of SDG 3 in policy 1 was + 20 percentage points. However, this is visualised in the choice sets as 100%, as the current SDG situation before the change was 80%.

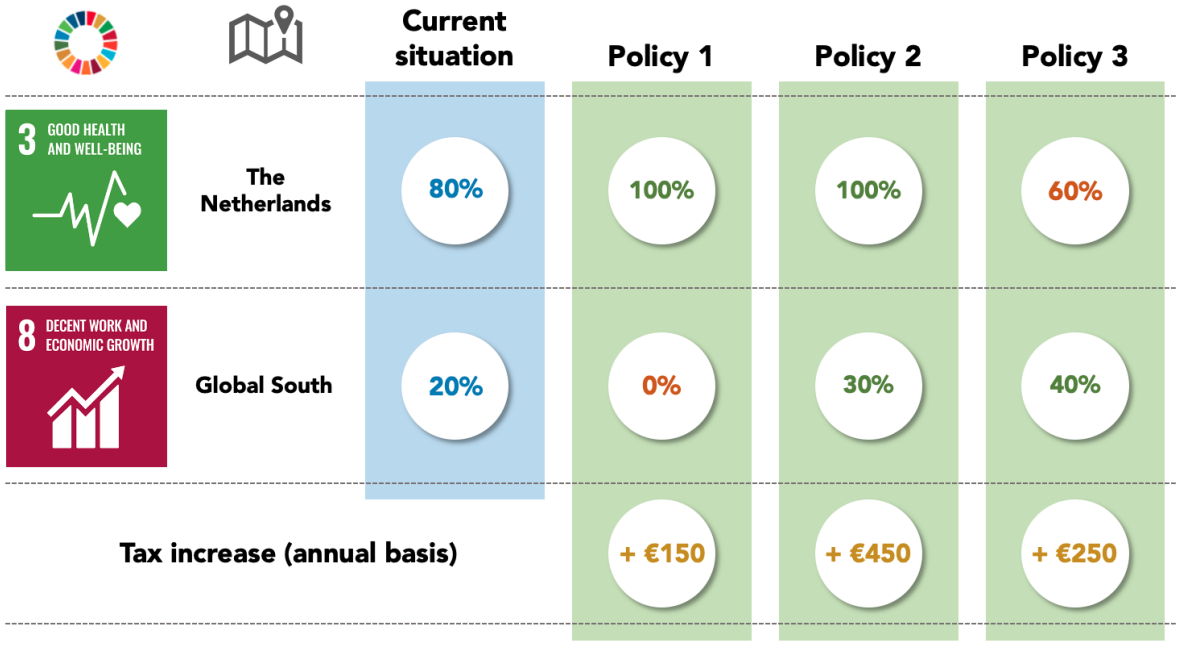


Figure 4.1: Example of a SDG choice set

After all 1000 choice sets were generated, several rounds of checks were applied. These checks were aimed at achieving three things: deleting alternatives with a double decrease in SDG action, deleting duplicate alternatives, and deleting so-called dominant alternatives. Alternatives with a double decrease in SDG action are not realistic, as a national government would never spend tax money with the goal of only letting two SDGs deteriorate. Duplicate alternatives are also not realistic, as no government would propose two equal policies in the same choice. Finally, dominant alternatives are disadvantageous for the information that one can deduce from the choice behaviour. A dominant alternative is defined as an "alternative with more preferred levels with respect to all attributes" (Crabbe and Vandebroek, 2012, p. 23). The inclusion of these alternatives should be avoided, as respondents will always prefer them over others, leading to a decrease in information and an increase in the possibility of parameter bias (Bliemer et al., 2017; Crabbe and Vandebroek, 2012). The checks, which were pieces of code that looped through the generated collection of choice sets, removed any of these double decrease, duplicate or dominant alternatives. They then generated new random policy packages and continued until all remaining alternatives were acceptable.

4.1.4 Additional questions

To be able to investigate the effect of the background variables established in Chapters 2 and 3, the DCM choice sets alone are not enough. Several additional questions are required to determine these variables for each respondent. For most of the demographic characteristics of citizens, these questions are fairly straightforward. In the case of gender, age and education, a multiple choice question with all possible answers (including the possibility not to answer if this is desired by the respondent) suffices. For the other background variables, however, measurement

is slightly more complicated. There is not a set amount of SDG knowledge levels, nor are there predetermined levels for the beliefs concerning sustainable development and development aid. For these background variables, the so-called 'Likert scale' is used. Respondents can indicate how strongly they agree or disagree with a certain statement, which is perfect for the nature of the SDG-related background variables. An example of such a Likert-scale is presented in Figure 4.2.

To what extent do you agree with the following statement?

Sustainable development aid administered by the Dutch government to developing countries contributes to growth in those developing countries.

Strongly disagree ☐ ☐ ☐ ☐ ☐ *Strongly agree*

Figure 4.2: An example of a 5-point Likert scale question

The example given in Figure 4.2 uses a 5-point Likert scale, meaning that respondents have five levels of agreement at their disposal. In the final survey, this 5-point Likert scale is used for all non-demographic questions, except the question concerning the position within the domestic-foreign trade-off. That question uses a 7-point Likert scale. The exact setup and wording of the questions can be found in Appendix B.1.

4.1.5 Final survey design

Using the software platform Qualtrics, the final survey was made which was sent out to respondents. It consists of two parts: one with the DCM choice sets, and one with the additional questions. In the part with the DCM choice sets, respondents were randomly assigned one of the 100 variants of 10 choice sets. Qualtrics ensured that all respondents were assigned a unique variant, until the 100 variants were all used. When all 100 variants were utilised, the random assignment started over. After having stated their preferences for the 10 choice sets, respondents were routed to the part with the additional questions. Depending on their qualification – citizen or policy maker – respondents received a role-specific set of questions. Appendix B.1 contains a complete description of the entire survey.

4.2 Population descriptions

This research strives to individually analyse two groups of people, and to compare results between the two. It is therefore required to clearly demarcate the two groups of interest, to map some characteristics of these groups, and to discuss how samples from the groups were obtained.

4.2.1 Dutch citizens

Dutch citizens are classified as all non-policy maker civilians currently living in the Netherlands. According to the Dutch Central Agency of Statistics, this group consists of approximately 17.4

million people (Centraal Bureau voor de Statistiek, n.d.-c). Table 4.2 shows the gender, age and educational level distributions of Dutch citizens.

Table 4.2: Demographic characteristics of the population of Dutch citizens, based on CBS (n.d.-a) and CBS (n.d.-b))

Demographic	Category	Percentage of respondents
Gender	*Male*	49.7%
	Female	50.3%
Age	*<25 years*	27.9%
	25-35 years	12.9%
	36-45 years	11.9%
	46-55 years	14.2%
	56-65 years	13.6%
	>65 years	19.6%
Educational level	*Primary school*	8.8%
	Secondary school	18.4%
	Vocational school	38.4%
	University of Applied Sciences & University - bachelor's	21.6%
	University of Applied Sciences & University - master's & Doctorate/PhD	12.8%

As already briefly discussed in Chapter 3, the main sampling methods used were convenience and snowball sampling. For the sampling of citizens, the distributing of the survey happened mainly through internet. The survey was posted on LinkedIn (via personal channels and via the channel of TU Delft Global), via e-mail and via messaging platforms. These methods of sampling may have lead to some bias, which is discussed in-depth in Chapter 7.

4.2.2 Dutch policy makers

Dutch policy makers are classified as all Dutch citizens employed at one of the ministries, or elected in either the Dutch House of Representatives or Senate. The amount of ministry employees is estimated to be 110.000, and the number of seats in the House of Representative and Senate combined is 225 (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2010). Table 4.3 shows the distribution of employees per ministry.

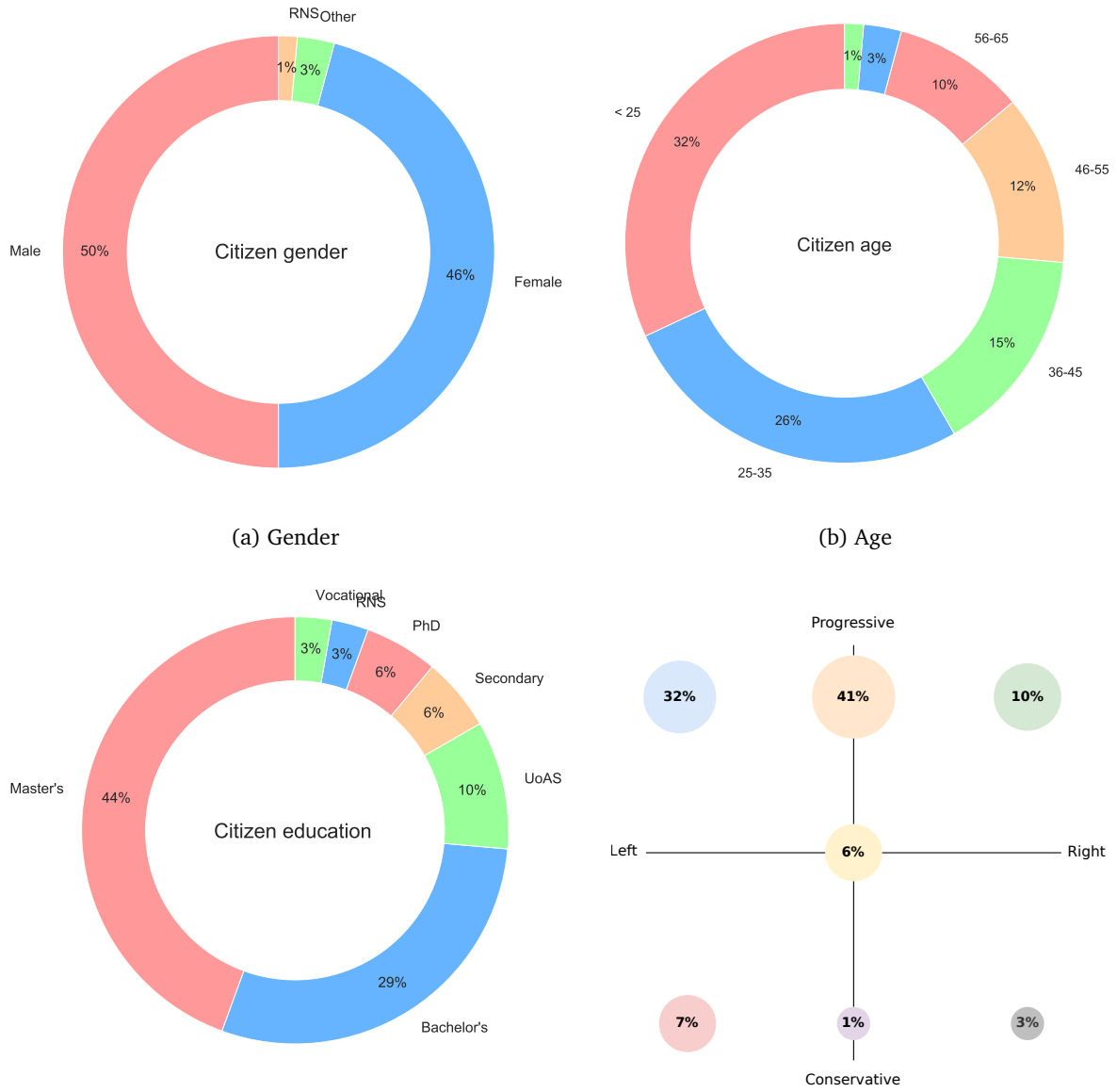
Table 4.3: Number of employees per Dutch ministry, based on Rijksoverheid (2017)

Ministry	Employees
Ministry of General Affairs	353
Ministry of Domestic Affairs	2652
Ministry of Foreign Affairs	9180
Ministry of Defence	Unknown
Ministry of Economic Affairs and Climate	9133
Ministry of Finance	29321
Ministry of Infrastructure and Water Management	12412
Ministry of Agriculture, Nature and Food Quality	Unknown
Ministry of Education, Culture and Science	4191
Ministry of Social Affairs and Employment	2626
Ministry of Justice and Security	27276
Ministry of Health, Well-being and Sports	4424

For the sampling of members from the House of Representative and Senate, solely e-mail distribution was used. All e-mail addresses are public, which meant that no privacy was breached by contacting the members. For policy makers, Sandra Pellegrom – the Dutch National SDG Coordinator – helped with the distribution. She kindly used her business network to send out the survey to the different ministries. Once again, in both situations, snowballing by respondent was allowed and encouraged. Possible bias induced by the sampling methods is discussed in Chapter 7.

4.3 Sample results

In total, 119 respondents completed the survey. 33 of these respondents classified themselves as a policy maker employed by one the Dutch ministries, the Dutch House of Representatives or the Dutch Senate. The remaining 76 respondents are classified as citizens. Figure 4.3 shows the gender, age, educational level and political preference distributions for the citizen sample. Looking at these distributions, one can conclude that a good mix of genders is achieved, and that (to a great extent) most demographic categories have been reached. There does seem to be an overrepresentation of respondents (a) under 35, (b) with university educational levels, and (c) with progressive ideological preferences. Where necessary, Chapter 6 contains statistical tests that analyse the representativeness of the demographic distributions in the citizen sample. Chapter 7 discusses any potential bias that is introduced by a misrepresentative sample.



(a) Gender

(b) Age

(c) Educational level

(d) Political preference

Figure 4.3: Citizen sample characteristics

The citizen sample showed a substantial amount of SDG knowledge: the majority of citizen respondents placed themselves on a 3 out 5 position or higher (5 being very knowledgeable). Figure 4.4 visualises the chosen 5-Point Likert scale answers for this background variable. This could either mean that the level of SDG knowledge among citizen is in fact high, or it could mean that only citizens with an interest in the SDGs have taken part in the survey. What this high knowledge level could potentially mean for the results, is further discussed in Chapter 7.

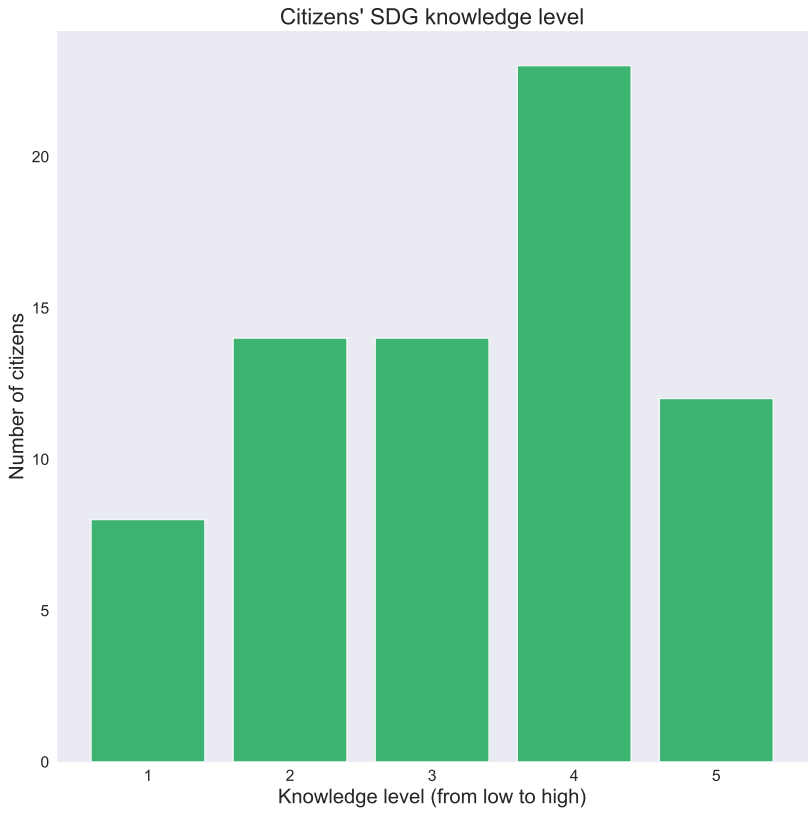


Figure 4.4: SDG knowledge level of citizens

The policy maker sample shows an overrepresentation of employees of the Dutch Ministry of Foreign Affairs, as can be seen in Figure 4.5. Another large proportion contains respondents from the Dutch House of Representatives and Dutch Senate. The remaining respondents states to be employed at the Ministries of (a) Economic Affairs, (b) Finance, and (c) Domestic Affairs. This means that there are no respondents from the remaining eight ministries. What the overrepresentation of Foreign Affairs policy makers could potentially mean for the results, is further discussed in Chapter 7.

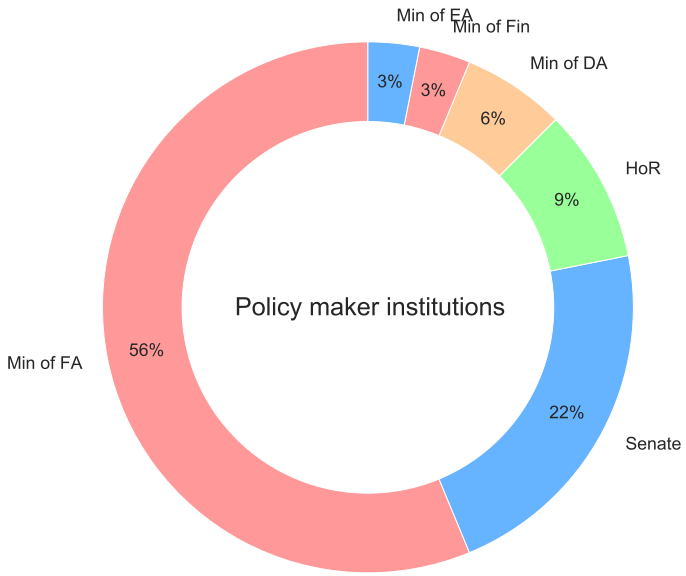


Figure 4.5: Distribution of policy maker institutions

For the sake of brevity, the remaining diagrams that show the Likert scale answers to the other background variable questions have been included in Appendix C. The main conclusions that can be drawn from these background variable answers are the following:

- The extent to which policy makers in the sample believe the SDGs are too complex is low to moderate.
- The extent to which policy makers in the sample believe the SDGs are not feasible is low to moderate.
- The extent to which policy makers in the sample believe that the COVID-19 pandemic has altered Dutch governmental SDG policies is moderate.
- Both citizens and policy makers in the sample believe to a high extent that development aid contributes to growth in developing countries; policy makers to a higher extent than citizens.
- Both citizens and policy makers in the sample believe to a moderate/high extent that development aid should be conditional; citizens to a higher extent than policy makers.
- The distribution of position in the domestic-foreign trade-off of citizens and policy makers in the sample is centred around the middle, which shows that the highest amount of respondents of both groups does not make a distinction between domestic and foreign SDG focus. The distribution appears to follow the shape of a normal distribution.

While the DCM setup does not enable the investigation of opt-out behaviour – also called hard refusals – as no such alternative was added to the choice sets. It is, however, possible to examine so-called soft refusals. This means that people show lexicographic behaviour when choosing there preferred alternative in each choice set. Lexicographic behaviour occurs when a respondent

always chooses the alternative in which one attribute consistently comes out best (Rouwendal and De Blaeij, 2004). In the case of this research, this would likely be the tax attribute. If a respondent were to actually dislike all SDG action alternatives, he or she would probably choose the alternative with the least financial consequences, when forced to choose. It is therefore insightful to run a scan through the data, to see how many respondents consistently chose an alternative with the lowest yearly tax payment. Such a scan was performed using a piece of Python code, and the results show that only two respondents showed lexicographic behaviour. This is approximately 1.7% of the total sample. Both these respondents classified themselves as a policy maker.

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Chapter 5

Model estimations

Having obtained data from both Dutch citizens and Dutch policy makers, the next step is to estimate choice models that best represent actual citizen and policy maker SDG preferences. This chapter discusses the models that have been estimated, the utility functions that were used, and compares the estimated models with each other in terms of goodness of fit. Using the models, it becomes possible to gain insight into possible prioritisations that are made by either of the two study groups, and to investigate the influence of the background variables. This chapter provides an answer to the third sub-question of this research: *which estimated choice models correctly represent the SDG preferences of Dutch citizens and Dutch policy makers?*

5.1 Introductory notes on the estimation process

In total, 36 different choice models were estimated. The estimation was executed using a software package in Python called 'PandasBiogeme' (Bierlaire, 2020). The gathered respondent data exported from Qualtrics was not immediately ready for use in PandasBiogeme, which is why the data set was first thoroughly cleaned using a self-made piece of code in Python. The model estimation code has not been included in this thesis, but the utility functions that were used for the estimation *are*. These equations, by means of example, display the utility functions in the given situations for one alternative (policy 1). However, the functions follow the same formulation for the other two alternatives/policies. Throughout this chapter, each section reflects on a different set of model estimations. All 36 model estimations are described and visualised in detail in Appendix D, and each section clearly refers to the corresponding part of this appendix. An overview of all models and their characteristics can be found in Table 5.1.

Table 5.1: All estimated models and their characteristics

Model	Sample	Current situation	Location	Loss aversion	Full-SDG	Clustering	study group dist.	Background var.
1	Total	Interaction effect	Split parameters			✓		
2	Total	Interaction effect	Split parameters			✓	✓	
3	Total	Interaction effect	Split parameters			✓		
4	Total	Interaction effect	Split parameters			✓	✓	
5	Total	Interaction effect			✓			
6	Total	Interaction effect	Interaction effect		✓			
7	Total	Interaction effect	Interaction effect		✓			
8	Total	Interaction effect	Interaction effect	Interaction effect	✓			
9	Total	Interaction effect	Interaction effect	Interaction effect	✓		✓	
10	Total		Split parameters		✓			
11	Total	Percentage changes	Split parameters		✓			
12	Total	Interaction effect	Split parameters		✓			
13	Total		Split parameters		✓		✓	
14	Total	Interaction effect	Split parameters		✓		✓	
15	Total	Interaction effect	Split parameters	Split parameters	✓			
16	Citizen	Interaction effect	Split parameters			✓		
17	Citizen	Interaction effect	Split parameters			✓		
18	Citizen	Interaction effect			✓			
19	Citizen	Interaction effect	Split parameters		✓			
20	Citizen	Interaction effect	Split parameters	Split parameters	✓			
21	Policy maker	Interaction effect	Split parameters			✓		
22	Policy maker	Interaction effect	Split parameters			✓		
23	Policy maker	Interaction effect	Split parameters		✓			
24	Policy maker	Interaction effect	Split parameters		✓			
25	Policy maker	Interaction effect	Split parameters	Split parameters	✓			
26-36	Mix	Interaction effect	Split parameters		✓			✓

5.2 Total sample models

There are two methods of distinguishing the study groups of Dutch citizens and Dutch policy makers: (1) estimating models for the total sample (videlicet: the two study groups combined) that include parameters used to observe group differences, and (2) estimating separate models for both study groups. Both methods have been used in this research. This section covers the models estimated according to the former method; using the total sample. The order in which the models are discussed, follows a clear rationale: the model with the least number of parameters is treated as the base model. All following models are compared with the base model in order of their parameter amounts.

5.2.1 SDG cluster models

The models that require the least amount of parameters, follow the two most common SDG categorisation theories as discussed in Chapter 2: the 'wedding cake' and the 5Ps. By estimating

models for both these types of clustering, it becomes clear whether citizen and policy maker preferences follow along the lines of these conceptual categorisations. Detailed descriptions and visualisations of the estimations can be found in Appendix D.1.

In the case of the wedding cake model (model 1 in Table 5.1), the amount of parameters is ten; two for each wedding cake category (split for SDG action in the Netherlands and in the Global South), one for the effect of the current SDG situation, and one for the effect of the required extra yearly tax payment. Equation 5.1 shows the utility function that is used for the first alternative/policy:

$$
\begin{aligned}
V_{policy\ 1} = & \Bigg(\Big(\Big(\beta_{society\ NL} + (\beta_{current} * x_{SDG\ 1\ current}) \Big) * x_{SDG\ 1\ NL\ change-1} \Big) + \\
& + \Big(\Big(\beta_{society\ GS} + (\beta_{current} * x_{SDG\ 1\ current}) \Big) * x_{SDG\ 1\ GS\ change-1} \Big) \Bigg) + \cdots_{society} + \\
& + \Bigg(\Big(\Big(\beta_{biosphere\ NL} + (\beta_{current} * x_{SDG\ 6\ current}) \Big) * x_{SDG\ 6\ NL\ change-1} \Big) + \\
& + \Big(\Big(\beta_{biosphere\ GS} + (\beta_{current} * x_{SDG\ 6\ current}) \Big) * x_{SDG\ 6\ GS\ change-1} \Big) \Bigg) + \cdots_{biosphere} + \\
& + \Bigg(\Big(\Big(\beta_{economy\ NL} + (\beta_{current} * x_{SDG\ 8\ current}) \Big) * x_{SDG\ 8\ NL\ change-1} \Big) + \\
& + \Big(\Big(\beta_{economy\ GS} + (\beta_{current} * x_{SDG\ 8\ current}) \Big) * x_{SDG\ 8\ GS\ change-1} \Big) \Bigg) + \cdots_{economy} + \\
& + \Bigg(\Big(\Big(\beta_{partnership\ NL} + (\beta_{current} * x_{SDG\ 17\ current}) \Big) * x_{SDG\ 17\ NL\ change-1} \Big) + \\
& + \Big(\Big(\beta_{partnership\ GS} + (\beta_{current} * x_{SDG\ 17\ current}) \Big) * x_{SDG\ 17\ GS\ change-1} \Big) \Bigg) + \\
& + (\beta_{tax} * x_{tax,1})
\end{aligned}
\tag{5.1}
$$

where:

$V_{policy1}$	= observed utility obtained from policy 1
$\beta_{society\ NL}$	= weight attributed to a change in the SDGs belonging to the 'society' category in the Netherlands
$\beta_{society\ GS}$	= weight attributed to a change in the SDGs belonging to the 'society' category in the Global South
$\beta_{current}$	= the effect that the current situation has on the weight of the change of any SDG
$x_{SDG\ 1\ NL\ change-1}$	= the change of SDG 1 in the Netherlands in policy 1
$\beta_{SDG\ 1\ GS\ change}$	= weight attributed to the change of SDG 1 in the Global South
$x_{SDG\ 1\ GS\ change-1}$	= the change of SDG 1 in the Global South in policy 1
$\cdots_{society}$	= a repetition of the above for all other SDGs in the 'society' category
β_{tax}	= weight attributed to an increase in yearly tax payments

The model is an improvement on a model which has all parameters set to zero. This can be concluded from the value of ρ^2, which in this case is 0.147; a reasonably good model fit. ρ^2 is calculated as follows:

$$\rho^2 = 1 - \frac{LL_{estimated}}{LL_{initial}} \tag{5.2}$$

where:

$LL_{estimated}$ = the log-likelihood of the estimated model

$LL_{initial}$ = the log-likelihood of the model with all parameters set to zero

Both for $LL_{estimated}$ and ρ^2, the following applies: the higher the value, the better the model fit (Train, 2003). It can be seen in Table D.2 that all parameters except $\beta_{partnership\ NL}$ are significant at the 5% level. This is concluded from the fact that all p-values are below 0.05.

To investigate the difference between Dutch citizens and policy makers when it comes to their preference for wedding cake categories, a so-called interaction effect is added to the utility function (model 2 in Table 5.1). This takes on the following form:

$$V_{policy\ 1} = \Bigg(\Big(\big(\beta_{society\ NL} + (\beta_{group} * x_{group}) \big) + \big(\beta_{current} * x_{SDG\ 1\ current} \big) \Big) * x_{SDG\ 1\ NL\ change-1} \Bigg) + \cdots \tag{5.3}$$

where:

β_{group} = the effect that the respondent's study group has on $\beta_{society\ NL}$

x_{group} = the respondent's study group

When comparing the two models, it can be seen that the model with a group interaction effect does not have a higher log-likelihood or ρ^2 than the model without. This means that the former has a better model fit.

The two types of models were also estimated using the theory of the 5Ps (models 3 and 4 in Table 5.1). The same conclusion can be drawn as in the case of the wedding cake theory: the model without group interaction effect proves to be a better fit than the model without. Table 5.2 shows all estimated models as discussed so far. It can be seen that the first model – the model using the wedding cake theory without a study group interaction effect – best fits the choice data.

Table 5.2: Model estimations for the total sample

Number	Model	Number of par.	Log-likelihood	ρ^2	Best model fit?
1	*Wedding cake theory*	10	-999	0.141	Yes (1)
2	*Wedding cake theory including a group interaction effect*	11	-999	0.141	No
3	*5Ps theory*	12	-1000	0.140	No
4	*5Ps theory including a group interaction effect*	13	-1000	0.140	No

5.2.2 Full-SDG models

Cluster models do not provide enough insights to be able to draw conclusions for the SDGs individually. For this, models with specific SDG parameters are necessary. These models either incorporate the location of SDG action, or the current SDG situation, or neither. There are several manners of including these factors. First, a model without any location distinction was estimated (model 5 in Table 5.1). The utility function for this model is as follows:

$$\begin{aligned} V_{policy\ 1} = & \left(\left(\left(\beta_{SDG\ 1\ change} + (\beta_{current} * x_{SDG\ 1\ current}) \right) * x_{SDG\ 1\ NL\ change-1} \right) + \right. \\ & + \left. \left(\left(\beta_{SDG\ 1\ change} + (\beta_{current} * x_{SDG\ 1\ current}) \right) * x_{SDG\ 1\ GS\ change-1} \right) \right) + \\ & + \cdots + (\beta_{tax} * x_{tax,1}) \end{aligned} \tag{5.4}$$

where:

$\beta_{SDG\ 1\ change}$ = weight attributed to a change in SDG 1, independent of the SDG location

$\cdots$ = a repetition of the above for all other SDGs

This model, showing a log-likelihood of -990, seems to be a better fit than the wedding cake model. To confidently state so, however, an additional test is required. Performing the so-called 'Ben-Akiva & Swait test' provides evidence to be able to statistically acknowledge the better model fit of, in this case, the full-SDG model without a location distinction. At the heart of this test lies the following equation:

$$p = NormSDistr\Big(- \sqrt{2 * N * ln(J) * \frac{(LL_{worse} - LL_{better})}{LL_0}} \Big) \tag{5.5}$$

where:

N = sample size

J = number of alternatives per choice set

LL_{worse} = the log-likelihood of the model that performs worse

LL_{better} = the log-likelihood of the model that performs better

The p-value which is yielded in Equation 5.5 is the upper bound for the probability that the worse model in fact outperforms the better model in the population. A value below 0.05 means that – at the 5% level of statistical significance – the better model fit also applies in the population. In this case, the value of the Ben-Akiva & Swait test is $1,10 * 10^{-5}$, and thus smaller than 0.05. The full-SDG model without location distinction is statistically a better fit than the wedding cake model.

SDG location interaction effect

Secondly, given the full-SDG model, an interaction effect is added to incorporate the location of SDG action – the Netherlands or the Global South (model 6 in Table 5.1). This is done in the same way as in Equation 5.3. Using this method of distinction is a parsimonious manner of doing so, utilising as few parameters as possible (another manner of distinguishing locations is by estimating location-specific parameters – such a model is discussed later on in this section). The model proves to be a better fit than the model without location distinction, given the lower log-likelihood value and significant Ben-Akiva & Swait test value. Additionally, a model is estimated which contains a study group interaction effect (model 7 in Table 5.1). This model, however, is not a better fit than the model without the group distinction.

Loss aversion

Thirdly, several models are estimated to investigate the existence of loss averse behaviour among Dutch citizens and policy makers. Loss aversion, a concept first introduced by psychologists Kahneman and Tversky in the late seventies, means that individuals consider losses of a higher importance than gains (1979). A more scientific way of putting this, is that the slopes of the indifference curves of individuals who are more averse to losses, are steeper than those of individuals less averse to losses (Starmer, 2000). In the case of this research, a hypothesis could be that Dutch citizens and/or policy makers deem a deterioration of an SDG more 'important' than an improvement of that SDG – important in the sense that the individual would rather see no deterioration than an improvement of the SDG. Alternatively, for some SDGs an opposite finding might arise.

The most parsimonious method of testing for loss aversion, is by adding a dummy variable to the choice data, which takes on the value -1 in the case of an SDG deterioration, and the value of +1 in the case of an SDG improvement (model 8 in Table 5.1). An interaction effect using this dummy is then added to the utility function, following the same technique as in Equation 5.3. Once again, an additional model is estimated with a study group interaction effect, to test for difference in loss aversion behaviour between both groups (model 9 in Table 5.1). Both models are a better fit than the model without location distinction. The model with the study group interaction effect is an even better fit than the model without.

Current SDG situation

Fourthly, the effect of the current SDG situation is investigated by estimating three models. The number of parameters of these models is larger than the previous models, as the SDG location is taken into account by estimating separate location-specific parameters for each SDG. This makes it possible to see whether certain SDGs are attributed more weight in certain locations than others. The first of the three models is a one which does not include an effect of this current situation (model 10 in Table 5.1). It uses the following utility function:

$$V_{policy\ 1} = \Big((\beta_{SDG\ 1\ NL\ change} * x_{SDG\ 1\ NL\ change-1}) + \\ + (\beta_{SDG\ 1\ GS\ change} * x_{SDG\ 1\ GS\ change-1}) \Big) + \\ + \cdots + (\beta_{tax} * x_{tax,1}) \tag{5.6}$$

where:

$\beta_{SDG\ 1\ NL\ change}$ = weight attributed to the change of SDG 1 in the Netherlands

The second of three models is one that takes the current SDG situation into account by re-coding the percentage point changes in the choice sets to percentage changes (model 11 in Table 5.1). One could imagine the following: a percentage point change of +20 in a current situation of 20%, is a higher percentage change than the same percentage point change in a current situation of 80%. Namely, respectively, 100% and 25%. These percentage point changes are calculated using the standard formula in Equation 5.7:

$$Percentage\ change = \frac{New\ SDG\ situation - Old\ SDG\ situation}{Old\ SDG\ situation} * 100\% \tag{5.7}$$

Using these changes instead of the percentage point changes does not require a different utility function, but does require a different interpretation of the estimated parameters. In Equation 5.6, $\beta_{SDG\ 1\ NL\ change}$ and $\beta_{SDG\ 1\ GS\ change}$ represent the utility gained due to a percentage point increase in SDG change. In the model with percentage changes, these parameters now represent the utility gained due to a percentage increase in SDG change relative to the current situation.

The third of three models incorporates the current SDG situation by using an interaction effect, as was done (for example) in Equation 5.4 (model 12 in Table 5.1). Of the three models, this third models proves to be the best fit. However, while being insightful, none of the three models are a better fit in the population than the loss aversion model with study group distinction.

Finally, the model without the current SDG situation and the model with the current SDG situation interaction effect are enriched with a study group interaction effect (models 13 and 14 in Table 5.1). However, these models do not prove a better fit than their counterparts without the group distinction. Also, another model is estimated to check for loss-averse behaviour (model 15 in Table 5.1). This time, increase- or decrease-specific parameters are estimated for each SDG, leading to a total of 70 parameters. The following utility function is used:

$$
\begin{aligned}
V_{policy\ 1} = & \left(\left(\left(\beta_{SDG\ 1\ NL\ increase} + (\beta_{current} * x_{SDG\ 1\ current}) \right) * x_{SDG\ 1\ NL\ increase-1} \right) + \right. \\
& + \left(\left(\beta_{SDG\ 1\ NL\ decrease} + (\beta_{current} * x_{SDG\ 1\ current}) \right) * x_{SDG\ 1\ NL\ decrease-1} \right) + \\
& + \left(\left(\beta_{SDG\ 1\ GS\ increase} + (\beta_{current} * x_{SDG\ 1\ current}) \right) * x_{SDG\ 1\ GS\ increase-1} \right) + \\
& + \left(\left(\beta_{SDG\ 1\ GS\ decrease} + (\beta_{current} * x_{SDG\ 1\ current}) \right) * x_{SDG\ 1\ GS\ decrease-1} \right) + \\
& + \cdots + (\beta_{tax} * x_{tax,1})
\end{aligned}
\tag{5.8}
$$

where:

$\beta_{SDG\ 1\ NL\ increase}$ = weight attributed to the increase of SDG 1 in the Netherlands

$x_{SDG\ 1\ NL\ increase-1}$ = the increase of SDG 1 in the Netherlands in policy 1

$\beta_{SDG\ 1\ GS\ increase}$ = weight attributed to the increase of SDG 1 in the Global South

$x_{SDG\ 1\ GS\ increase-1}$ = the increase of SDG 1 in the Global South in policy 1

Given the value of the log-likelihood and of the Ben-Akiva & Swait test, this model proves to be the best fit of all the total sample models. However, the amount of significant parameters is very low, meaning that not a lot can be said about the loss aversion behaviour itself. Chapter 6 contains an analysis and interpretation of this finding. A summary of all full-SDG models estimations for the total sample is given in Table 5.3.

Table 5.3: Full-SDG estimations for the total sample

Number	Model	Number of parameters	Log-likelihood	ρ^2	Best model fit?	Ben-Akiva & Swait
5	*Without location distinction*	19	-990	0,149	Yes (2)	$1,10 * 10^5$
6	*With location interaction effect*	20	-987	0,151	Yes (3)	$7,14 * 10^3$
7	*With location and group interaction effects*	21	-987	0,152	No	
8	*With location and LA interaction effects*	21	-958	0,177	Yes (4)	$1,30 * 10^{14}$
9	*With location, LA and group interaction effects*	23	-955	0,179	Yes (5)	$7,14 * 10^3$
10	*Without current situation*	35	-995	0,145	No	
11	*With percentage changes*	35	-1030	0,114	No	
12	*With current situation interaction effect*	36	-979	0,158	No	
13	*Without current situation, with group interaction effect*	36	-995	0,145	No	
14	*With current situation and group interaction effects*	37	-979	0,158	No	
15	*With split LA parameters*	70	-933	0,198	Yes (6)	$1,63 * 10^{11}$

5.3 Separate citizen and policy maker models

The second way of distinguishing the groups of Dutch citizens and policy makers is by splitting the data set of all respondents. This was done by running a Python script that used the dummy

variable stating which study group a respondent belongs to. The running of this script resulted in two separate data files, and models were estimated using both these data sets. The models that were estimated are, respectively: a wedding cake model, a 5Ps model, a model without location effect, a model with current SDG situation effect, and a model taking loss aversion into account. The separately estimated models are insightful, as they provide group-specific information for all SDGs, where the total sample models only provided higher-level group effects for the entire package of SDGs. Detailed descriptions and visualisations of the estimations can be found in Appendices D.2 and D.3.

Table 5.4 shows all the models estimated for the citizen sample (models 16 up to and including 20 in Table 5.1). It can be seen that the wedding cake model fits better than the model using the 5Ps theory. However, the full-SDG models fit better than the models using categorisation techniques. Of these full-SDG models, the model including split loss aversion parameters fits best. While this is the case, the model does not provide SDG-specific insights, as almost all parameters are insignificant and have large standard errors. Model 19, a model that does not include a loss aversion effect, can therefore be appointed as most insightful and best fitting of the citizen models.

Table 5.4: Model estimations for the citizen sample

Number	Model	Number of parameters	Log-likelihood	ρ^2	Best model fit?	Ben-Akiva & Swait
16	*Wedding cake theory*	10	-689	0,146	Yes (1)	
17	*5Ps theory*	12	-691	0,143	No	
18	*Full-SDG, without location distinction*	19	-681	0,156	Yes (2)	$3,15 * 10^5$
19	*Full-SDG, with current situation interaction effect*	36	-674	0,164	Yes (3)	$9,11 * 10^5$
20	*Full-SDG, with split LA parameters*	70	-643	0,203	Yes (4)	$1,69 * 10^{15}$

Table 5.5 shows all the models estimated for the citizen sample (models 21 up to and including 25 in Table 5.1). The same conclusions can be drawn as in the case of the citizen models, except for the models that used a categorisation theory. In the case of Dutch policy makers, the 5Ps model fits better than the wedding cake model.

Table 5.5: Model estimations for the policy maker sample

Number	Model	Number of parameters	Log-likelihood	ρ^2	Best model fit?	Ben-Akiva & Swait
21	*Wedding cake theory*	10	-305	0,147	Yes (1)	
22	*5Ps theory*	12	-300	0,161	Yes (2)	$7,82 * 10^4$
23	*Without location distinction*	19	-298	0,164	Yes (3)	$2,27 * 10^2$
24	*With current situation interaction effect*	36	-282	0,209	Yes (4)	$7,69 * 10^9$
25	*With split LA parameters*	70	-244	0,316	Yes (5)	$1,41 * 10^{18}$

5.4 Background variable models

To test for the influences that demographic factors and certain viewpoints on the SDGs have on the preferences of Dutch citizens and policy makers, several models are estimated to which an

interaction effect is added. These interaction effects are all connected with additional questions from the survey, which are written up in Appendix B. Detailed descriptions and visualisations of the estimations can be found in Appendix D.4.

All the interaction effect models follow the same rationale, and the utility function form for these models is as follows (in this example an interaction effect for citizen gender has been added):

$$\begin{aligned} V_{policy\ 1} = &\left(\left(\left(\beta_{SDG\ 1\ NL\ change} + (\beta_{current} * x_{SDG\ 1\ current}) + (\beta_{gender} * x_{gender})\right) * x_{SDG\ 1\ NL\ change-1}\right) + \right. \\ &\left. + \left(\left(\beta_{SDG\ 1\ GS\ change} + (\beta_{current} * x_{SDG\ 1\ current}) + (\beta_{gender} * x_{gender})\right) * x_{SDG\ 1\ GS\ change-1}\right)\right) + \\ &+ \cdots + (\beta_{tax} * x_{tax,1}) \end{aligned} \tag{5.9}$$

where:

β_{gender} = the effect that gender has on the weight of the change of any SDG

x_{gender} = the citizen's gender

The models testing for an effect of demographic variables have only been performed for the citizen sample, as only this group was asked corresponding questions. Models testing for the effects of SDG complexity and feasibility, and of COVID-19 have only been performed for the policy maker group due to the same reason. The remaining estimations have been performed for the entire sample.

The model fit varies per case. For all estimated models, a statistical comparison of the fit is made by performing Ben-Akiva & Swait tests. A summary of the models is given in Table 5.6.

Table 5.6: Interaction effect models

Interaction effect	Reference log-likelihood	Reference ρ^2	Log-likelihood	ρ^2	Better than reference? (5% / 10%)
Total sample, aid optimism	-979	0.158	-971	0.165	Yes / yes
Total sample, aid conditionality	-979	0.158	-979	0.158	Yes / yes
Total sample, domestic-foreign trade-off	-979	0.158	-978	0.159	Yes / yes
Citizen sample, gender	-674	0.164	-674	0.164	No / no
Citizen sample, age	-674	0.164	-672	0.166	No / yes
Citizen sample, education	-674	0.164	-673	0.165	No / no
Citizen sample, political preference	-674	0.164	-673	0.165	No / no
Citizen sample, SDG knowledge	-674	0.164	-672	0.166	No / yes
Policy maker sample, SDG complexity	-282	0.209	-279	0.216	No / no
Policy maker sample, SDG feasibility	-282	0.209	-280	0.215	No / yes
Policy maker sample, COVID-19 influence	-282	0.209	-279	0.216	No / no

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Chapter 6

Analysis and interpretation of the results

The 36 model estimations as reviewed in Chapter 5 have yielded a myriad of results. In this chapter, these results are analysed and interpreted. It discusses general findings for the total sample, findings for Dutch citizens and Dutch policy makers separately, comparative findings between the two study groups, and findings for the effects of the background variables. All the model estimations in this chapter are described and visualised in detail in Appendix D, and each section clearly refers to the specific part of Appendix D it discusses. This chapter provides an answer to the fourth and fifth sub-questions of this research, respectively: *to what extent do Dutch citizens and Dutch policy makers prioritise certain SDGs, and to what extent do both study groups differ in their SDG preferences?* And: *what are possible explanations for the individual SDG preferences of by Dutch citizens and Dutch policy makers and the mutual relationship between these preferences?*

6.1 General findings

There are several general conclusions to be drawn from the estimation data. First of all, the current SDG situation has a moderate effect on an individual's SDG preferences. The model that incorporates the current situation using percentage changes did not turn out a better fit than the model without current SDG situation effect, whereas the model that incorporated the current situation using an interaction effect did. This means that the model with percentage changes was too 'heavy', and that the current situation has a more subtle effect. This effect – $\beta_{current}$ in the estimation – was picked up by the other model, and takes on the value of $-4,44 * 10^{-4}$. This means that an increase in the current SDG situation of 5%, causes a 0.49% reduction in the weight attributed to an SDG change.

Secondly, given the good fit of the models taking the concept of loss aversion into account, it can be stated that individuals show loss aversion behaviour when it comes to their SDG preferences. Model 8 (in Table 5.1) shows a significant value of β_{LA} – defined as the importance attributed to decreases or increases of SDGs – of -0.0424. This means that SDG action is valued more important in the case of a decrease than in the case of an increase. When looking at model 9,

to which a study group interaction effect is added, it can be seen that this interaction effect is significant. The value of this parameter is -0.0251, and shows that citizens are more loss-averse than policy makers when it comes to SDG action. Model 15, the loss aversion model with split parameters per SDG increase and decrease, also shows that respondents show loss-averse behaviour. However, out of 34 SDG increase/decrease parameter sets, only 7 are statistically significant. Given the large standard errors for these sets, it is impossible to claim a statistically significant difference between the increase and decrease SDG weights. Unfortunately, it is thereby not possible to measure loss aversion behaviour individually. One of the most plausible reasons for this insignificance is the size of the data sets. The estimation of increase and decrease parameters doubles the amount of parameters, while the size of the data remains equal. As the data sets are relatively small, the doubled parameters have to work with a limited amount of cases. This likely leads to many of the parameters not being statistically significant. More on this limitation can be found in Chapter 7.

Finally, the estimations show that the location where an SDG change takes place has an influence on the SDG preferences of individuals. This can be derived from the fact that models in which no location parameters are estimated, with utility functions as the one in Equation 5.4, do not fit better than models with location-specific parameters. Also, when looking at the model with a location interaction effect, this effect is statistically significant with a value of 0.00379. Thus: SDG actions in the Global South are attributed 13% more importance than SDG actions in the Netherlands. In this regard, there are no differences between the groups of Dutch citizens and policy makers. The model which adds a study group interaction effect to the location interaction effect – model 7 – is not a better fit and the study group interaction effect is not statistically significant.

6.2 SDG prioritisations

One of the focal points of this research is to find out the individual preferences of SDGs amongst both Dutch citizens and policy makers. This is done by reviewing the parameter estimates of the models for both study groups, and by comparing them. The paragraphs below contain an analysis and interpretation of these estimates. All conclusions drawn are based upon the detailed descriptions and visualisations in Appendices D.2 and D.3.

6.2.1 Dutch citizens

Figure 6.1 shows the weights that Dutch citizens attribute to the changes of SDGs in the different locations. The y-axis portrays the value of the parameters, and the x-axis the parameters themselves, sorted from highest to lowest value. The black lines in each bar represent the 95% confidence intervals, calculated as follows:

$$CI_{95\%} = x_{value} \pm 1.96 * SE_x \tag{6.1}$$

where:

$x_{parameter}$ = the value of parameter x

SE_x = the standard error of x

A rule of thumb is that for a difference in parameters to be statistically significant at the 5% level, the confidence intervals should not overlap. If they do, it cannot be claimed that the two parameters differ in the population. In this case, the 90% interval can be used to see if the parameters do significantly differ at the 10% confidence level. This interval is obtained by using Equation 6.1, and replacing 1.96 with 1.645.

Figure 6.1 shows that there are few significant preferences between SDGs. From the few that are significant, however, clear preferences arise. Dutch citizens relatively reject SDG 17 (partnership for the goals):

- SDG 6 and SDG 13 in the Global South are significantly preferred over SDG 17 in the Netherlands and in the Global South
- SDG 13 and SDG 2 in the Netherlands are significantly preferred over SDG 17 in the Netherlands

This acknowledges a preference for (a) climate action, (b) clean water and sanitation, and (c) the tackling of undernourishment, and shows that Dutch citizens find it of less importance that countries work together to achieve these two challenges. When utilising the 90% confidence intervals, even more SDGs are significantly preferred over SDG 17.

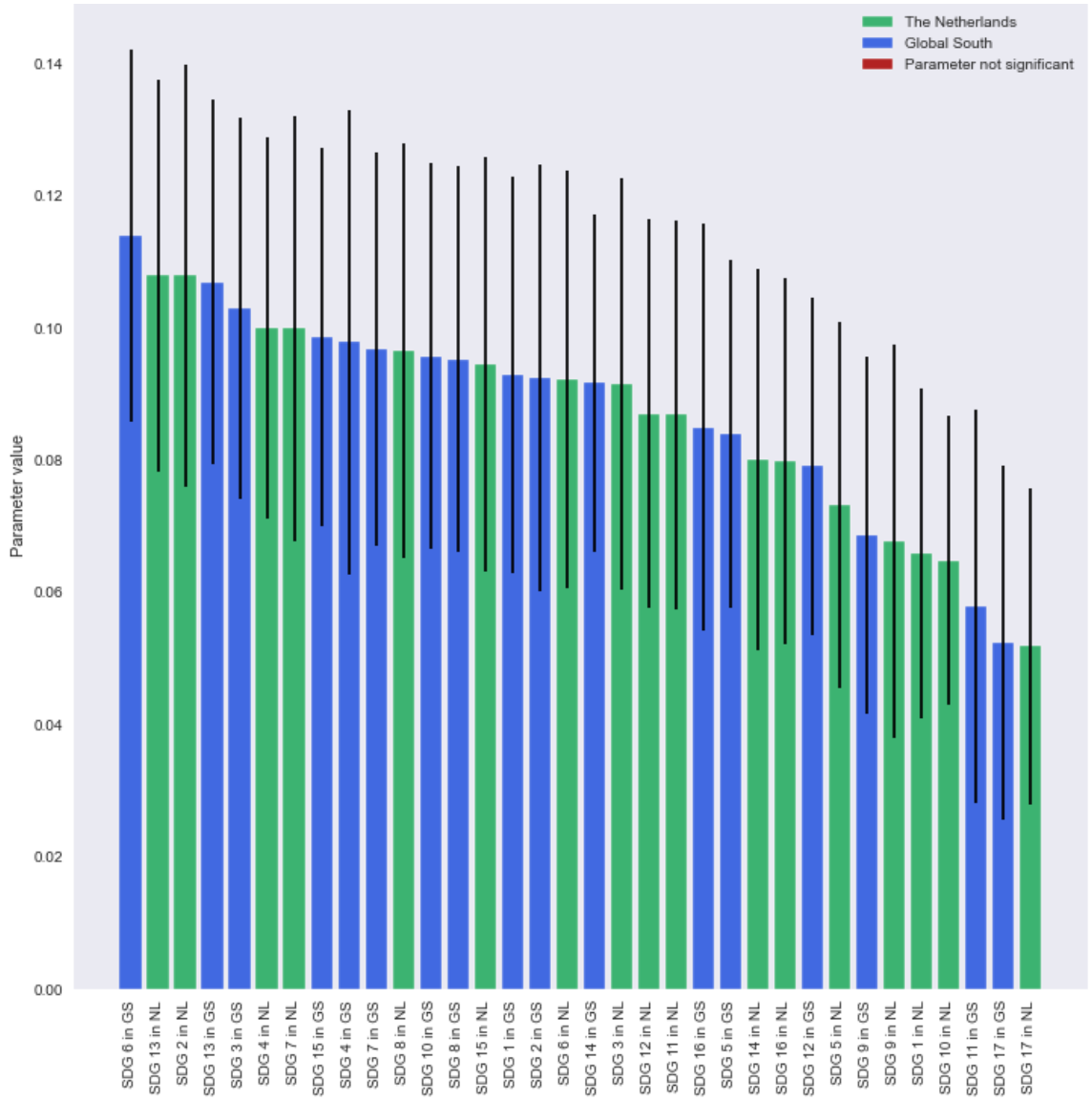


Figure 6.1: SDG preferences of Dutch citizens, sorted by parameter value

Figure 6.2 displays the same data as Figure 6.1, but ordered per SDG, to visualise the differences between SDG locations. Utilising both a 95% confidence interval (as in the bar graph) and a 90% confidence interval, no significant differences appear between two locations for the same SDG. It can thus be concluded that, while having an effect on individuals' SDG preferences, for Dutch citizens the location of an SDG does not significantly distinguish preferences within the same SDG.

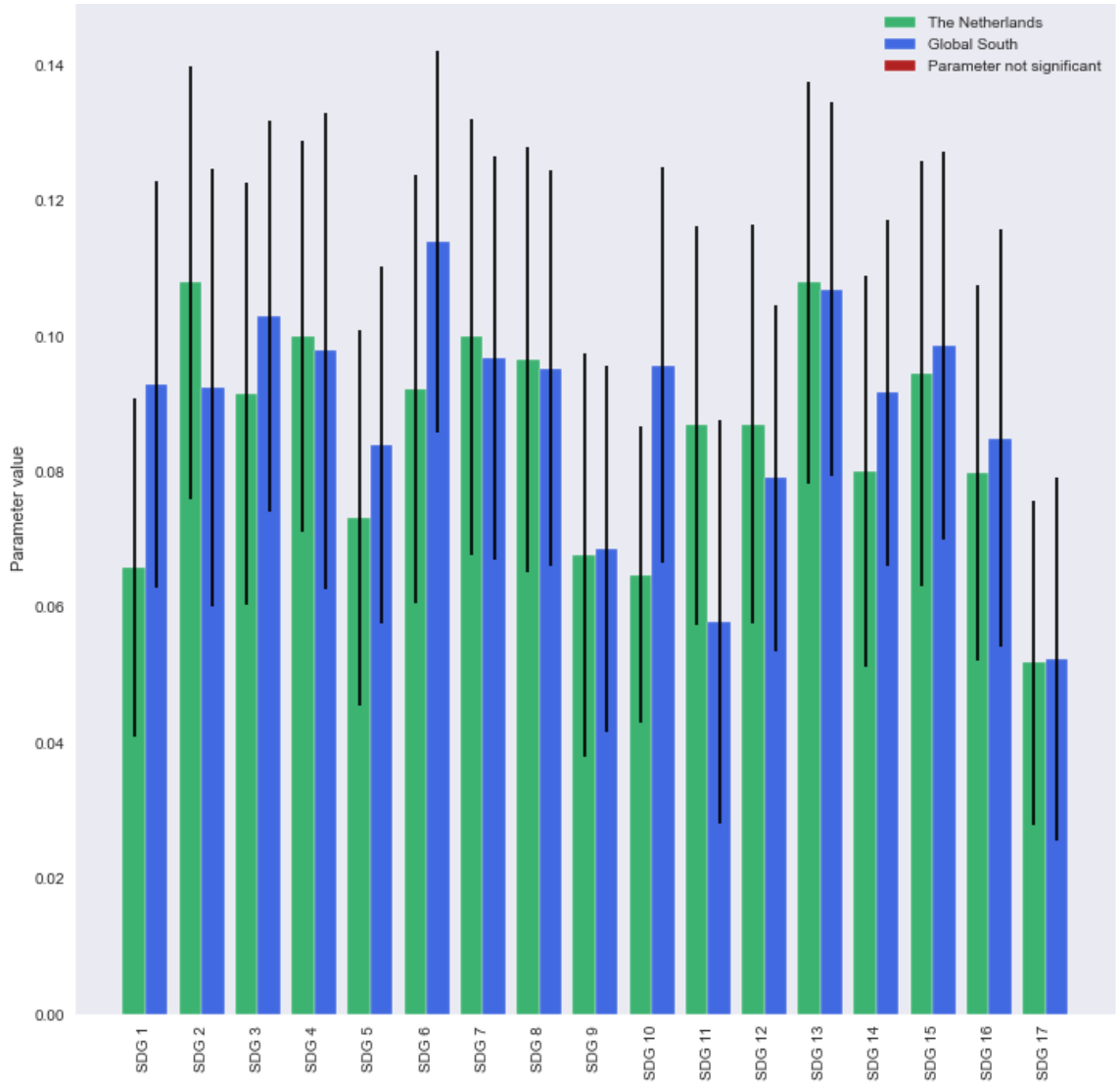


Figure 6.2: SDG preferences of Dutch citizens, sorted by SDG

Regarding the effect of the current situation and of the tax payments for the policies, the parameters and their corresponding p-values are displayed in Table 6.1. Both parameters are significant at the 5% level, indicating that both have an effect on citizens' SDG preferences. The value of $\beta_{current}$ indicates that a 5% increase in the current SDG situation, causes a 0.53% reduction in the weight attributed to an SDG change by citizens.

Table 6.1: Current situation and tax parameters for Dutch citizens

Parameter	**Value**	**p-value**
$\beta_{current}$	-0.000478	$1.80 * 10^{-6}$
β_{tax}	-0.00105	0.0426

As for β_{tax}: this parameter can be used to calculate citizens' WtP for an SDG increase. The

formula for the WtP is the following:

$$WtP = \frac{\beta_{SDG\ change}}{\beta_{tax}} \tag{6.2}$$

As the calculation of WtP is commonly performed for variables which individuals would rather not see increase, the parameter values for these variables are negative, as is (usually) the parameter for costs. In the case of this research, however, individuals would actually *prefer* to see an increase in the variables. Hence, the parameters for SDG change are, as expected, positive. To not receive negative WtP values as a consequence, the formula is adjusted accordingly so that the values of $\beta_{SDG\ change}$ are in fact negative. When calculating the WtP values for all SDGs in all locations, one can derive a range of financial amounts that individuals are willing to pay in taxes for SDG improvement. From low to high, the range of WtP levels of Dutch citizens is €49.43 – €108.57 per SDG per location on a yearly basis.

6.2.2 Dutch policy makers

Table 6.3 shows the weights that Dutch policy makers attribute to the changes of SDGs in the different locations. Once again, given the rule of thumb concerning the overlapping of confidence intervals, little statistically significant preferences appear. However, the following can be ascertained:

- In the Netherlands, SDG 15 is significantly preferred over SDG 7, 8 and 9

This shows that, within the Netherlands, policy makers deem the preservation and protection of terrestrial ecosystems of a higher importance than (a) the access to affordable and sustainable energy, (b) the promotion of sustainable economic growth, and (c) resilient infrastructures, sustainable industrialisation and innovation. When utilising the 90% confidence intervals, also SDG 10 (a reduction of inequalities) and SDG 13 in the Global South become more important than these three SDGs in the Netherlands. Unlike Dutch citizens, SDG 17 is not rejected. That being said, as can be seen in Figure 6.3, the parameter value of SDG 17 in the Netherlands is not statistically significant at the 5% level. Therefore, it is not possible to confidently claim anything about this parameter.

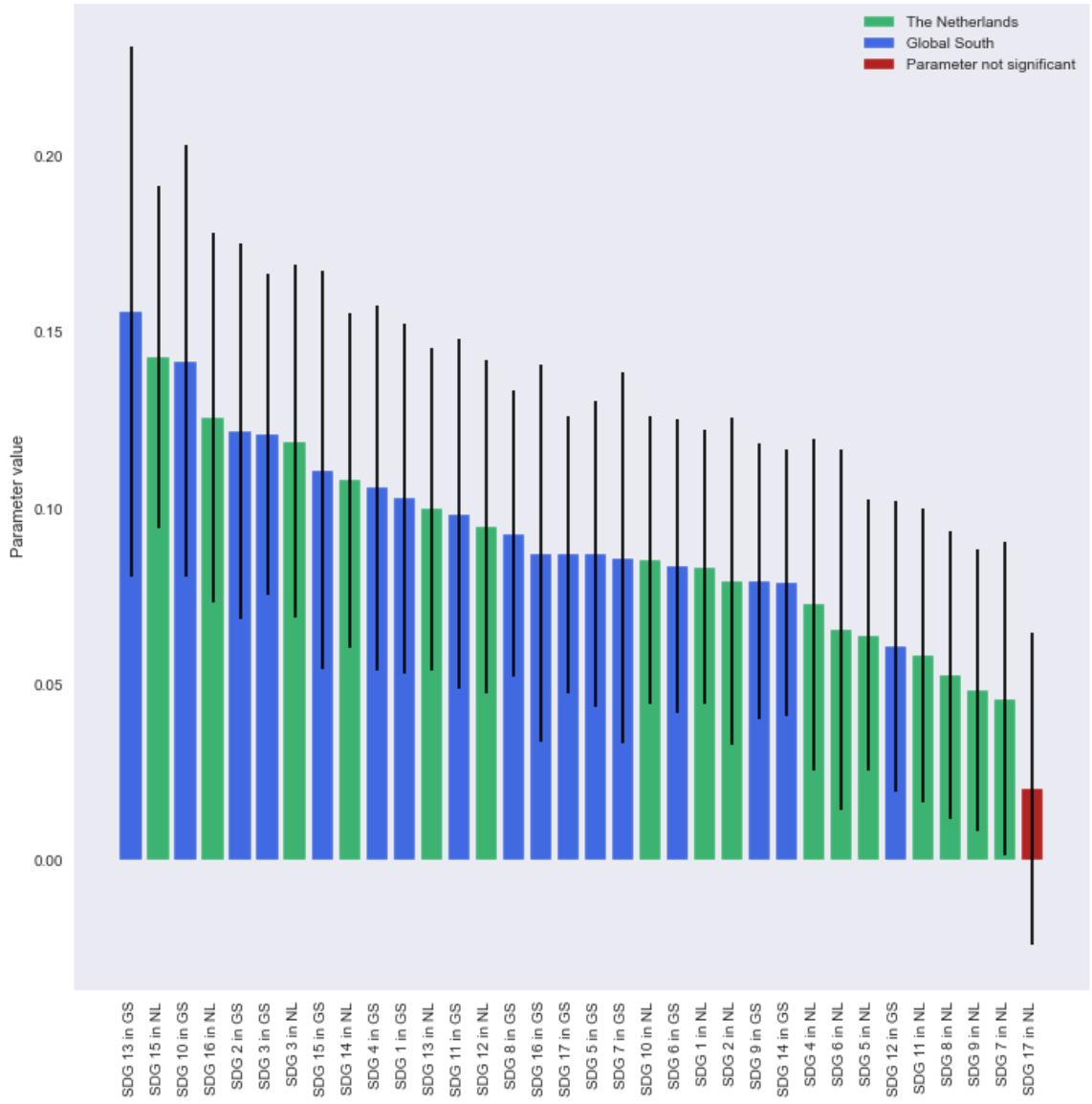


Figure 6.3: SDG preferences of Dutch policy makers, sorted by parameter value

Figure 6.4 displays the same data as Figure 6.3, but ordered per SDG. Within the sample, this figure shows that Dutch policy makers have a strong preference for SDG change in the Global South. This can be explained by the large proportion of policy maker respondents employed by the Ministry of Foreign Affairs. Given both the 95% and the 90% confidence intervals, however, this Global South preference does not apply in the population. Thus: while having an effect on individuals' SDG preferences, for Dutch policy makers the location of an SDG does not significantly distinguish preferences within the same SDG. Yet, the confidence interval approach is a conservative one. One could speak of an indication of Global South-leaning SDG preferences of Dutch policy makers.

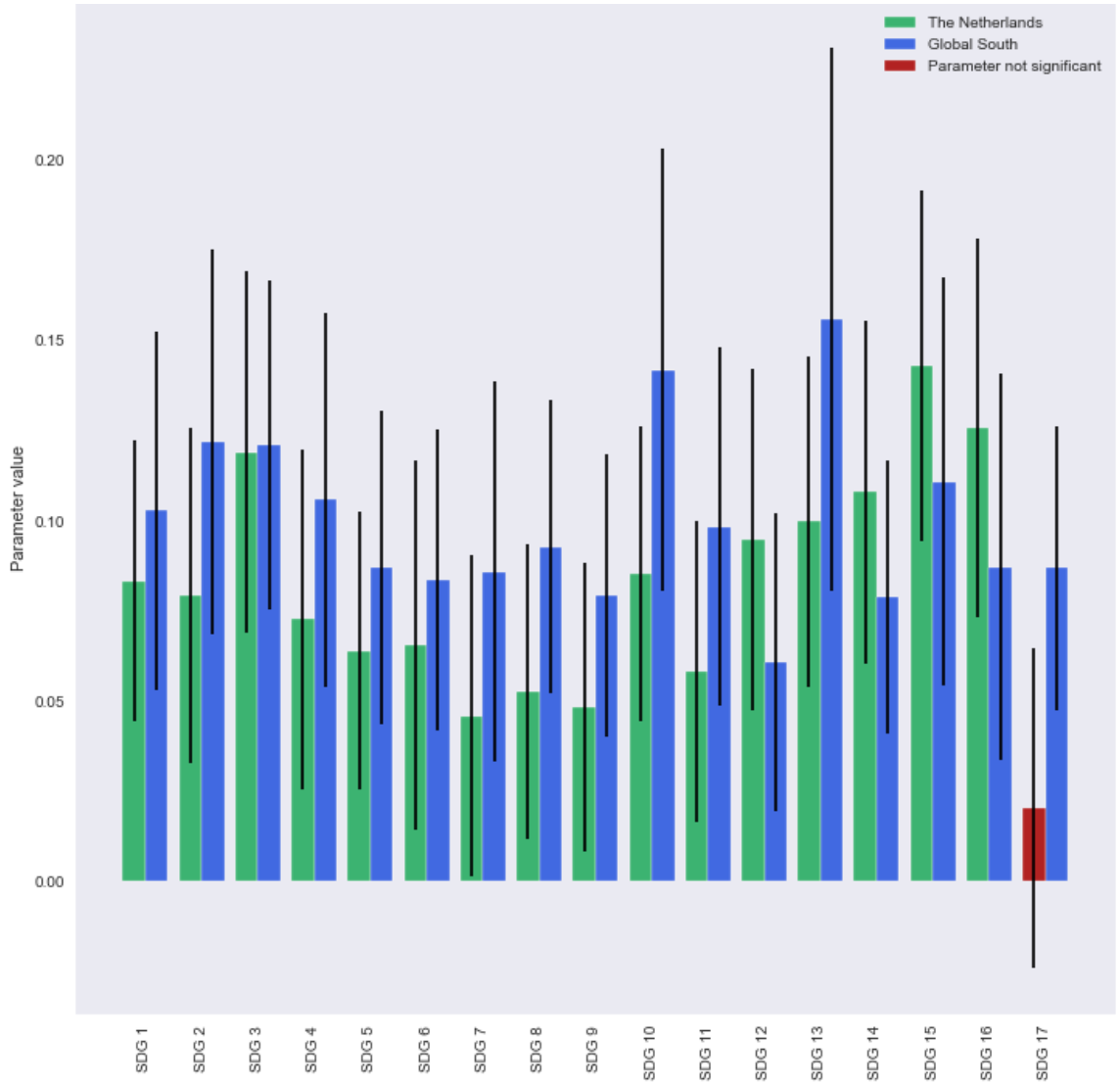


Figure 6.4: SDG preferences of Dutch policy makers, sorted by SDG

Table 6.2 contains the parameter estimates and corresponding p-values for $\beta_{current}$ and β_{tax}. Both are significant at the 5% level. The value of $\beta_{current}$ indicates that a 5% increase in the current SDG situation causes a 0.47% reduction in the weight attributed to an SDG change by citizens. As for the WtP of policy makers: the range of these levels (from low to high) is: €18.51 – €62.90 per SDG per location on a yearly basis.

Table 6.2: Current situation and tax parameters for Dutch policy makers

Parameter	**Value**	**p-value**
$\beta_{current}$	-0.000429	$5.72 * 10^{-3}$
β_{tax}	-0.00248	$2.53 * 10^{-3}$

6.2.3 Comparison between study groups

Comparing the SDG preferences becomes possible when looking at both sets of parameters, including the corresponding confidence intervals, side by side. Figure 6.5 contains all parameter values and confidence intervals for both Dutch citizens and policy makers. Once again, the rule of thumb dictates that non-overlapping confidence intervals signal statistically significant differences between parameters. However, as can be seen in Figure 6.5, this is not the case for any of the SDG parameters at the 95% confidence interval level. For the 90% confidence interval level, this finding remains so. It can thus be concluded that citizens do not significantly find any SDG more important than policy makers do, or vice versa. A conclusion that can confidently be drawn, however, (based on the results in Sections 6.2.1 and 6.2.2) is that citizens seem to reject SDG 17 relative to other SDGs, and that policy makers do not. Also, policy makers seem to prefer other SDGs over SDGs 7, 8, and 9, and citizens do not.

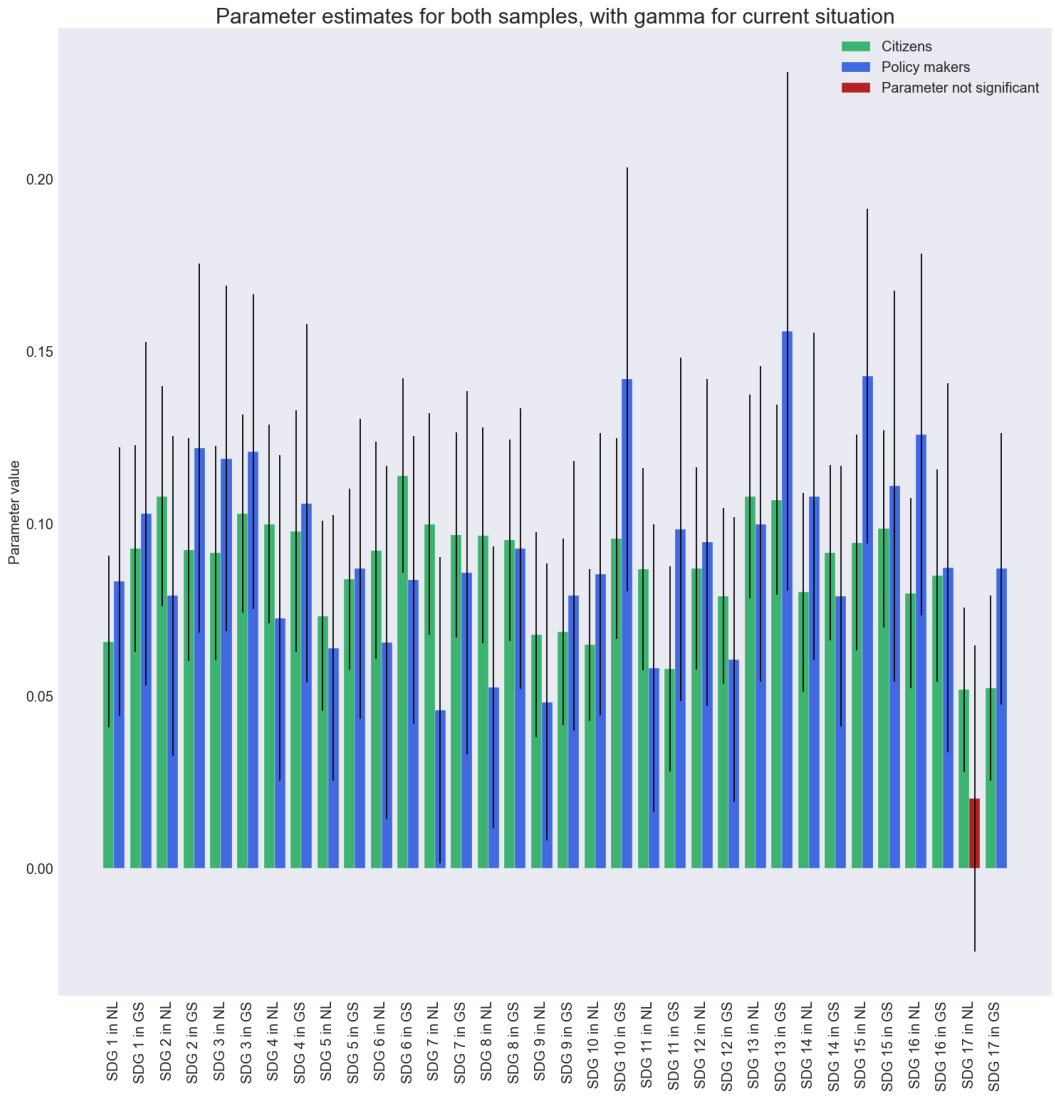
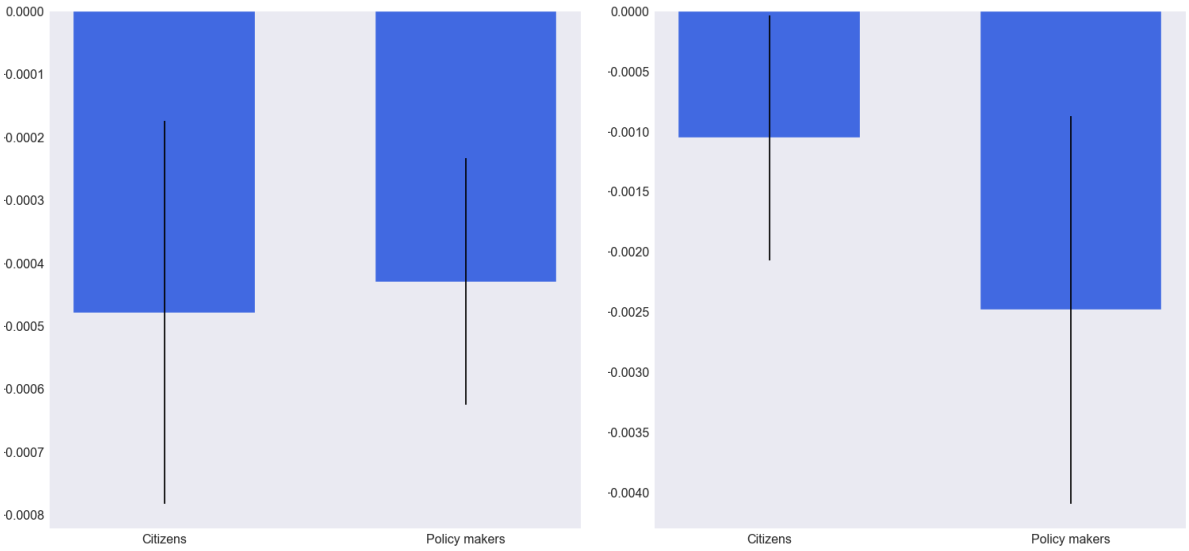


Figure 6.5: Parameter estimates for both study groups

Reviewing the individual values of $\beta_{current}$ and β_{tax}, gives the influence of the current SDG situation, and facilitates the calculation of WtP values. When comparing these parameter values of both study groups with each other, however, as is visualised in Figure 6.6, it becomes clear that no statistically significant difference exists between both groups in the population. It can be concluded that the current situation of an SDG and the costs of SDG change *do* influence citizens' and policy makers' preferences, but that the magnitude of these effects *do not* differ significantly between them.



(a) Effect of the current SDG situation

(b) Effect of taxes

Figure 6.6: Citizen and policy maker parameter comparisons

6.3 Cluster preference

While the models with the 5Ps and wedding cake clusterings have not proven to be a better fit than the models with separate SDGs, they can still be used to get an indication of which categories of SDGs are preferred over others by both study groups. Looking at the parameters and p-values in Appendix D, both methods of clustering point in the same direction. For Dutch citizens, Planet (5Ps) and Biosphere (wedding cake) in the Global South are significantly preferred over Partnership (5Ps and wedding cake) in both locations. This acknowledges the earlier finding that SDG 17 is rejected by citizens. For Dutch policy makers, less can be said. At the 5% significance level, no preferences are present. At the 10% level, however, Planet (5Ps) in the Netherlands is preferred over Prosperity (5Ps) in the Netherlands. This also acknowledges the earlier finding that life on land is preferred over economic growth and resilient infrastructures. As with the previous comparison between citizens and policy makers, no significant differences in the weights attributed to each category appear. The model fit values do show that, for citizens, the wedding cake model represents their choice behaviour more than the 5Ps. For policy makers, the opposite finding occurs.

6.4 Effect of citizen characteristics

To potentially explain the workings of citizen SDG preferences, it is relevant to look at the interaction effect parameters as described in Section 5.4. The values and corresponding p-values of these parameters are given in Table 6.3. Straight away, it can be seen that almost all parameters are not statistically significant at the 5% level. This would mean that citizens' gender, age, education and political preference do not explain their SDG preferences. However,

it is necessary to review whether the citizen sample is representative. This is done by using a statistical test to compare the sample distribution with the population distribution. The test is called the Kolmogorov-Smirnov test, and produces a test statistic with corresponding p-value. If this statistic is significant at the 5% level and the p-value is thus below 0.05, a difference in distributions between the sample and the population exists. For a sample to be representative − for no difference in distributions to exist − the p-value has to be above 0.05.

In the case of citizen gender, the sample can be said to be representative, as the value of the Kolmogorov-Smirnov test is 0.0243 with a p-value of 0.999. For this, the population distribution values have been used that are described in Chapter 4. In combination with the fact that the gender parameter is not statistically significant, it *can* be confidently said that an individual's gender *does not* explain citizen SDG preferences. The same applies to a citizen's level of education. The Kolmogorov-Smirnov statistic takes on the value of 0.5705 and has a p-value of 4.472. It *can* be confidently said that an individual's level of education *does not* explain citizen SDG preferences. For age, this cannot confidently be said. In this case the statistic takes on the value of 0.1709 with a p-value of 0.28. There is a significant difference in the distribution of the sample age and of the population age. It *cannot* confidently be said that age *does not* explain SDG preferences.

The effect of citizens' political preference is not significant. Unfortunately it is not possible to perform a Kolmogorov-Smirnov test, as there is no official population data for the political preference. A derivation using election data would be possible, but this would be too much of an assumption. When looking at the sample results in Chapter 4, it becomes visible that there is a strong lean towards the progressive side. Although there is no official data to debunk the following, it is expected that this distribution deviates from the true distribution in the population. It can therefore *not* confidently be said that political preference *does not* explain citizen SDG preferences. The extent to which citizens are informed about the SDGs *does* significantly have an effect on SDG preferences: for a 25% increase in knowledge regarding the SDGs, a 4.83% increase in weight attributed to SDG change is achieved. In other words: the more citizens know about the SDGs, the more they find it important that SDG change occurs.

Table 6.3: Citizen interaction parameters and corresponding p-values

Parameter	**Value**	**p-value**
Gender	-0.00265	0.714
Age	-0.00441	0.0788
Education	0.00395	0.248
Political preference	-0.00222	0.289
SDG knowledge	0.00599	0.0478

6.5 Effect of background SDG views

Table 6.4 shows the effects of views on several SDG topics for the total sample; the perceived effectiveness of development aid, the wish for development aid conditionality, and the desired focal point in terms of SDG location. From the corresponding p-values it becomes clear that only development aid optimism can significantly explain the SDG preferences of the total sample. For a 25% increase in the belief that development aid contributes to growth in developing countries, the weight attributed to an SDG change increases by 7.97%. Figure 6.7 contains the distributions aid optimism levels for citizens and policy makers in the sample. The overall level of optimism is high, which can explain why respondents deem SDG action in the Global South more important than in the Netherlands. It can be seen that policy makers have a higher belief in the effectiveness of development aid than citizens. This can explain the reason why the significant SDG preferences among policy makers do not appear among citizens. It can also explain why policy makers (in the sample) prefer SDG change in the Global South over SDG change in the Netherlands, and why citizens do not.

Table 6.4: Total sample SDG view parameters and corresponding p-values

Parameter	Value	p-value
Development aid optimism	0.0117	$4.83 * 10^{-5}$
Development aid conditionality	0.000699	0.823
Domestic-foreign trade-off	0.00261	0.348

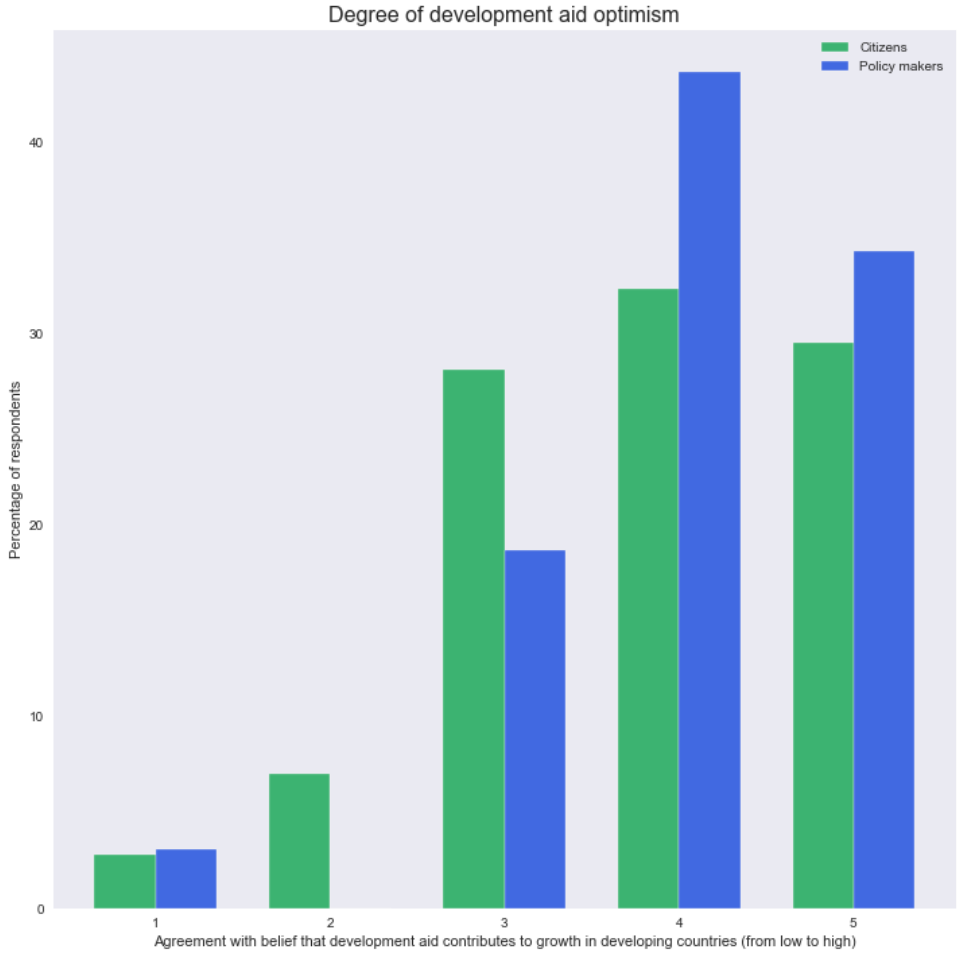


Figure 6.7: A comparison of the degrees of aid optimism between citizens and policy makers in the sample

Table 6.5 shows the effects of views on several SDG topics for the policy maker sample; the perceived complexity of the SDGs, the perceived feasibility of the SDGs, and the perceived effect of COVID-19 on government policy. All three parameters are significant at the 5% level, and facilitate the following statements:

- A 25% increase in the extent to which policy makers believe the SDGs are too complex leads to a 23% reduction in the weight attributed to SDG change
- A 25% increase in the extent to which policy makers believe the SDGs are not feasible leads to a 20.62% reduction in the weight attributed to SDG change
- A 25% increase in the extent to which policy makers believe that COVID-19 has changed the shape of governmental policy leads to a 10% increase in the weight attributed to SDG change

Table 6.5: Policy maker SDG view parameters and corresponding p-values

Parameter	**Value**	**p-value**
SDG complexity	-0.0121	0.025
SDG feasibility	-0.0113	0.0474
COVID-19 influence on government policy	0.0168	0.0245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Chapter 7

Conclusions, discussion and policy recommendations

After a comprehensive process of desk research, DCM experiment building, data gathering, and choice behaviour analysis, the time has come to conclude the research. One might ask oneself, like Franz Kafka does in The Metamorphosis: "But what if all the tranquillity, all the comfort, all the contentment were now to come to a horrifying end?" (Kafka, 1915, p. 14). This chapter serves the purpose of illustrating that this is by no means the case for this research. First of all, all five research sub-questions and the main research question are answered. Secondly, the limitations of the research are extensively discussed. Thirdly, taking the foregoing into account, several recommendations are made for the Dutch government. Finally, the societal and scientific contributions of this research are expounded, and several recommendations for future research are presented.

7.1 Answering the research sub-questions

In the introduction to this research, five sub-questions were suggested. The aim of these questions is to finally be able to answer the main research question. In this section, all five sub-questions are concisely answered.

1. What aspects related to the system of SDGs, sustainable development, development aid, and the phenomenon of prioritisation in general could potentially influence the SDG preferences of Dutch citizens and Dutch policy makers?

The SDGs are built around five critical areas of sustainable development, which are referred to as the 5Ps: people, planet, prosperity, peace, and partnership. All seventeen goals fall into one of these categories. Another way in which to categorise the SDGs is to use the so-called 'wedding cake'. This method assumes that SDGs related to the biosphere form the base of our planet, and that societal and economical SDGs are built upon this base. UN member states use different statistics to measure SDG progress, but the most common way is by using the official SDG indicators. SDG progress is commonly expressed in percentages.

The SDGs are characterised by a high degree of interlinkage. Some goals reinforce each other, and some goals counteract each other's progress. For governments, understanding these interlinkages is crucial when prioritising certain goals over others.

The SDGs are also subject to criticism. In some people's eyes the SDGs are too complex, while in others' they are too ambitious and unrealistic. This highlights the trade-off between complexity and feasibility. The notions of sustainable development and development aid – notions underlying the SDGs – also invoke criticism. People's opinions are divided when it comes to the effectiveness of development aid, also described as the level of aid optimism. In particular, three factors are relevant when people form their opinion on this effectiveness: the amount of available resources to the country that requests aid, the cost of the development aid, and the actual gains resulting from the aid. An important factor to keep in mind is that people are usually relatively ignorant regarding foreign aid policies. Finally, the conditionality of aid is also a criticism often heard. Some people only believe development aid should be administered if this aid is conditional; if rigid agreements are made pertaining to its use and to the financial pay-back structure.

Due to the rise of populist parties, a heated debate has started amongst both policy makers and citizens about whether budget allocation should be predominantly focused on domestic or foreign governmental policy, or somewhere in between. Some parties believe that all forms of development aid should be ended, whereas other parties believe such aid should be intensified. In an SDG context, this is interesting, as it brings up the question whether individuals value SDG-related domestic policies over SDG-related foreign policies, or vice versa. And, if so, does this trade-off have an influence on their SDG preferences?

It is plausible that certain situational factors influence citizens' and policy makers' SDG preferences, and can thus explain possible prioritisations made, or the possible absence thereof. The factors are divided in three categories. Firstly, demographic factors: individuals' gender, age and educational level. Secondly, political factors: individuals' ideological preferences, and their knowledge level of the SDGs. Thirdly, financial factors: individuals' Willingness to Pay.

2. How can the SDG preferences of Dutch citizens and Dutch policy makers (and all relevant factors potentially related to these preferences) best be measured?

Two methods are used for the collection of citizen and policy maker data: surveys and DCM. The package of SDGs is voluminous, and has a high degree of interlinkage, making it difficult for respondents to answers direct preference-related questions about them or rank all seventeen of them. This is where DCM proves to be a suitable method for the consultation of citizens and policy makers. Because the possible prioritisation of certain SDGs is believed to be a process of deliberate choice, DCM can pick up op the factors that drive this choice. The survey method is used to reach a large number of respondents and to include other questions than only the DCM experiment.

The main factors of interest, obtained from the answer to sub-question 1, are: the change in SDG achievement, the location of SDG action, the current level of SDG achievement, and the cost of SDG action. These factors are the so-called attributes, and will be varied within the

DCM experiment to find out what the effect of this variation is on individuals' SDG preferences. Besides the main attributes, several background attributes are investigated. These include: citizens' demographic characteristics, specific policy maker SDG views, and views on the notions of development aid and sustainable development.

In the final distributed survey, each respondent is presented with 2 parts: one part with 10 DCM choice sets, and one part with additional questions (concerning the background variables). In total, 119 respondents completed the survey, of which 33 classified themselves as policy makers, and 76 were classified as citizens.

3. Which estimated choice models correctly represent the SDG preferences of Dutch citizens and Dutch policy makers?

In total, 36 Discrete Choice Models were estimated to derive the most fitting representation of SDG preferences. All the models were estimated either for the total sample, or for the citizen and policy maker group separately.

When using a categorisation theory for the total sample, a model following the wedding cake theory fits the data best. Adding to this model an interaction effect to distinguish the two study groups does not prove to be a good fit. When looking at the two study groups separately, the results differ. For the citizen sample, the wedding cake model fits best, but when looking at the policy maker sample, a model following the 5Ps theory fits best.

Full-SDG models that include parameters for each SDG individually, give more insight into the SDG-specific preferences of both study groups. For the total sample, four main conclusions can be drawn. Firstly, full-SDG models fit better than categorisation models. Secondly, models that include the influence of the current SDG situation using an interaction effect fit better than models that omit the current SDG situation or include it using SDG percentage changes. Thirdly, models that *do* include an effect for the location of SDG action prove to be a better fit than models that *do not*. Finally, models that *do* take the notion of loss aversion into account, fit better than models that *do not*.

When estimating full-SDG models for the two samples separately, it appears that models taking loss aversion into account are the best fit for the data. These models, however, hardly yield any significant parameters and cannot be used to indicate SDG-specific preferences. Therefore, models with the second best fit are chosen as base models. These include the current SDG situation and distinguish SDG locations.

Factors that could explain SDG preferences have been included in models by adding interaction effects. For each additional question in the survey, an effect was added to see if a better model fit was achieved. The results varied per effect, but as it is possible that interaction effects alter the fit of other variables, they can all be used to provide information about the explanatory factors.

4. To what extent do Dutch citizens and Dutch policy makers prioritise certain SDGs, and to what extent do both study groups differ in their SDG preferences?

The results indicate that both study groups are largely on the same page. To a great extent, both groups do not prioritise certain SDGs over others. When looking at each SDG individually, no statistically significant differences in perceived importance are to be found between the groups. Two deviations to this finding, however, have been found. The first: Dutch citizens seem to reject SDG 17 relative to several other SDGs. In this relative rejection, a preference for planet- and people-related SDGs becomes apparent. The single relative rejection of SDG 17 implies that citizens do care about the SDGs being tackled, but care less about the manner in which this is brought forth – whether this is through multilateral cooperation or national inter-societal cooperation. Policy makers do not show this relative rejection. The second deviation: in the Netherlands, policy makers prefer SDG 15 over SDGs 7, 8 and 9. This implies that biodiversity is prioritised over certain economical and innovative SDGs in the Netherlands. Citizens do not show this prioritisation.

The model estimations for both study groups show that the current SDG situation has a moderate effect on SDG preferences. A 5% increase in the current SDG situation causes less than a 1% reduction in the weight attributed to SDG change, with no significant difference between both study groups. Also, the location of SDG action has an influence on SDG preferences. SDG action in the Global South is considered 13% more important than in the Netherlands, with no significant difference between both study groups. Finally, the results from both study groups indicate high levels of WtP levels, ranging from €18.51 to €108.57 per SDG per year. Again, no significant differences were found between the two groups.

The results also suggest loss-averse behaviour in an SDG context. Both models incorporating such behaviour prove to better fit the data than models that do not. It appears that citizens are more loss-averse than policy makers. Also, the two study groups differ when it comes to their behaviour being in line with a certain SDG categorisation theory. Citizen behaviour follows along the lines of the wedding cake theory, whereas the 5Ps theory better represents policy maker SDG behaviour.

5. What are possible explanations for the individual SDG preferences of by Dutch citizens and Dutch policy makers and the mutual relationship between these preferences?

Several factors can explain the results found for citizens' and policy makers' SDG preferences. Firstly, the level of knowledge that citizens have of the SDGs, has a significant influence on their perceived importance of SDG change. A 25% increase in this knowledge level leads to nearly a 5% increase in perceived SDG importance. As the level of knowledge in the citizen sample of this research is relatively high, this can explain why all SDG change parameters were significantly positive. Secondly, the effect of development aid optimism – the extent to which one believes that development aid contributes to growth in countries in the Global South – on SDG preferences is significant. A 25% increase in this belief leads to nearly an 8% increase in the SDG change weight. As policy makers show slightly higher levels of development aid optimism than citizens in the sample, this can explain why there are minor deviations in the SDG prioritisations between the two study groups. Also, as the overall level of development aid optimism in the total sample is high, the finding can explain why SDG action in the Global South is deemed more

important than in the Netherlands. Thirdly, the effects of (a) the perceived SDG complexity, and (b) the perceived SDG feasibility are both statistically significant. Increase of 25% in the level of perceived SDG complexity and perceived SDG feasibility lead to, respectively, a 23% and a 21% reduction in weight attributed to SDG change. Because the sample of this research displays low to moderate perceived levels of complexity and moderate to high perceived levels of feasibility, these factors can explain why the group of policy makers attribute significant weights to SDG change.

The effects of (a) individuals' wish for development aid conditionality and (b) their position within the domestic-foreign trade-off do not have a significant effect on SDG preferences. Furthermore, the results indicate that citizens' gender and education level do not have a significant effect on SDG preferences.

7.2 Answering the main research question

Having collected all necessary information in the five sub-questions, it becomes possible to answer the main question of this research. To clarify, this question is the following:

How do the preferences of Dutch citizens and Dutch policy makers with respect to the Sustainable Development Goals differ, and which factors could explain these preferences?

For the most part, the results indicate little differences between Dutch citizens and policy makers when it comes to their views on the SDGs. Both groups show few SDG prioritisations, and when looking at the SDGs individually, no significant differences exist between citizens and policy makers. Nonetheless, all SDGs parameters in all locations (with the exception of one) were found to be significantly different from zero, meaning that both groups regard SDG action as being of high importance. An explanation for this finding could be that the level of SDG knowledge has an effect on the preferences: the higher the knowledge level, the more important SDG improvement is deemed. As the level of knowledge in the research sample was moderate to high, this can explain why all SDGs are considered important. For policy makers specifically, an explanation for this importance is the fact that they show moderate to low levels of perceived SDG complexity and moderate to high levels of SDG feasibility. Both factors are found to have a significant effect on SDG preferences.

There is preliminary evidence that citizens and policy makers consider SDG action in the Global South more important than in the Netherlands. This finding could possibly be explained by the high level of development aid optimism that occurs in the sample, a factor which is found to have a significant effect on SDG preferences. When zooming in on individual SDGs, however, no significant differences appear between action for that SDG in the two different locations. This indicates that, on the whole, both citizens and policy makers are willing to help out in both their own country and foreign locations.

Despite the indicated unison between both study groups, there are several differences to be found. While both Dutch citizens and policy makers seem to show loss-aversion behaviour in their SDG

preferences, citizens do so to a greater extent than policy makers. In addition, when looking at individual SDGs, the results indicate two deviations between both groups. Relative to several other SDGs, citizens seem to reject SDG 17; partnership for the goals. This implies that citizens care about SDG change, but care less about how this change is brought about. Policy makers do not show this prioritisation. Conversely, policy makers prefer SDG 15 in the Netherlands over SDGs 7, 8, and 9 in the Netherlands. A slight prioritisation of biodiversity over economical and innovative SDGs becomes apparent in this prioritisation. Citizens do not show this behaviour. An explanation for this difference could be that policy makers show slightly higher levels of optimism regarding development aid, and that this has a significant effect on SDG preferences.

7.3 Limitations of the research

Given the fact that this research is a master's thesis for which limited resources are available and which requires completion within six months, some limitations are inevitable. It is important to take these limitations into account when considering the representativeness of the research findings. Before elaborating on the actual limitations, it can be concluded that the nature of these limitations leads to the research findings not being representative for the whole population of Dutch citizens or Dutch policy makers. This does not mean that the findings of this research are useless – on the contrary. When viewed as a preliminary study, this thesis can be used as an example for future research. Likewise, the policy recommendations do not lose their value. When keeping the limitations in mind, both the results and the policy recommendations remain relevant as societal and scientific contributions, and as information for the Dutch government.

The first and most obvious limitation is the size of the research samples. In total, 119 respondents took part in the survey, of which 76 citizens and 33 policy makers. Given the population sizes of both study groups, these respondent numbers are too low to be deemed representative samples. Well-known criticism of an absence of representativeness includes a lack of heterogeneity and biased research results. It can be concluded that the standard errors of the estimated parameters in this experiment's choice models are rather large. While these large standard errors could be due to the limited size of the research samples, this cannot confidently be affirmed; it is also possible that they are caused by a large amount of variability in the sample. This uncertainty should be carefully considered when observing the research findings, as it could be that the detected (to a great extent) lack of SDG differences between citizens and policy makers is due to the large standard errors caused by a limited sample size. As is discussed in Section 7.7, this provides opportunities for future research.

A second limitation is the bias that occurs as a result of the method of sampling. Due to the aforementioned time and resource constraints, the method of convenience sampling was predominantly used for the gathering of data. Using email, LinkedIn and direct messaging, the survey was spread solely via the internet. Only using these forms of communication involves all the risks that come with the self-selection of respondents. As can be seen from the results, the level of SDG knowledge was moderate to high, implying that the survey was mostly filled in by people with a personal or occupational interest for the SDGs. This could mean that the

importance attributed to SDG change is higher in the sample than it actually is in the population, as individuals with an interest in the SDGs tend to be in favour of speedy SDG action. Also, when looking at citizens' age and political preference, the sample is not representative. The age distribution in the sample is significantly different from the age distribution in the population, and although it is not possible to perform a statistical analysis for the representativeness of political preference, it is assumed that there is a mismatch in distributions here as well. Once again, both factors include the risk of potential bias. As the SDGs are a political policy package, it is plausible that one's ideological preferences influence one's views on the SDGs. The sample of this research shows high levels of progressive respondents, and low levels of conservative ones. The possibility exists that conservative respondents would fill in the survey differently and thus show different SDG preferences. The same can be said for the variation between citizens' age groups. For the policy maker group, the majority of respondents is employed by the Ministry of Foreign Affairs. In itself, this is not a surprising result; the package of SDGs is a multilateral policy measure, and the bulk of SDG action is performed under the guidance of the Minister for Foreign Trade and Development Cooperation (part of the Ministry of Foreign Affairs). Also, Sandra Pellegrom – the Dutch National SDG Coordinator – is part of the Ministry of Foreign Affairs. Sandra Pellegrom played a large role in distributing the survey among Dutch policy makers. Despite the majority not being a surprising finding, however, it might have had an influence on the SDG preferences. For example, it could have meant that SDG action in the Global South was overestimated by the estimated models, and that the SDG preferences do not resemble those of policy makers at other ministries. All these factors should be taken into account when reviewing the research results, as it could be that the SDG preferences of certain groups in the population were not adequately represented in this research experiment.

Thirdly, the method of DCM infers the risk of hypothetical bias. This concept means that individuals show different behaviour in hypothetical choice situations (like the ones in the experiment of this research) than they would in real-life choice situations. The reasoning behind this concept is that respondents in surveys do not 'feel' or experience the consequences of the actions they choose for in the choice experiment. In real-life, however, they do. Specifically for WtP, hypothetical bias can mean that respondents claim to be willing to pay more in the experiment than they would actually be willing to do in real life (Loomis, 2011). For this research, hypothetical bias could result in the WtP levels being overestimated by the choice models. If individuals would actually 'feel' the tax payments on a yearly basis, they might not show such a high WtP as was estimated.

7.3.1 Experiment imperfections

A final limitation lies in the fact that several assumptions were made in the experiment, which might have lead to inaccuracies in the measurement of SDG preferences. First of all, as has been extensively discussed in Chapter 4, the choice was made to exclude an opt-out alternative which respondents could use to reject all of the three policy options per scenario. While the choice was deliberately made, it does entail certain risks. The most obvious one is that it might lead to inaccurate results and thus to misleading policy recommendations (Campbell and Erdem, 2019). Specifically for this experiment, it could mean that the SDG change parameters were

overestimated, as respondents would have actually preferred to choose no SDG change in some or all scenarios. However, as the level of SDG knowledge and the level of aid optimism are moderate to high in the samples, it can be assumed that respondents would not often choose for an opt-out alternative as they are generally in favour of SDG action. On the other hand, more conservative individuals could be discouraged by the absence of such an alternative, and as a consequence might decide not to complete the experiment [1]. This, once again, leads to biased results.

A second experiment assumption is that the amount of locations in which SDG action occurs is limited to two: the Netherlands and the Global South. While this is a deliberate choice due to, once again, time and resource constraints, it is a choice that limits the information that is able to be extracted from the results. It is plausible that individuals do not see the Global South as one whole entity, but as a collection of countries that all deserve different levels of SDG attention. For example, a respondent might consider SDG 6 – clean water and sanitation – is of higher importance for Uganda than for Kuwait, while both countries are in fact part of the Global South. This nuance would be interesting information for societal and scientific purposes, but also for the Dutch government, as it receives a more detailed description of the public support for foreign development aid policies. In the current experiment setup, this information is not picked up.

Thirdly, the scenarios solely contain *increases* in tax expenditures. For all policies in all scenarios, the change in tax payments on a yearly basis vary between +€150 and +€450. It would, however, also be interesting to find out what happens to SDG preferences when the tax payments on a yearly basis *decrease* or *stay the same*. This includes the possibility for individuals that are more sceptical of the SDGs to state that they would, for example, prefer a decrease in tax payments over an increase in a certain SDG. Having not included these options in the current experiment setup might have lead to an overestimation of the levels of WtP. Because respondents simply were not given the choice to pay less tax or to reject all policies with an opt-out alternative, it is likely that the choice models misjudged the financial amounts respondents are willing to pay for SDG change.

Finally, the scenarios only contain increases and decreases of SDG achievement levels. For all policies in all scenarios, the change in SDG achievement is either -20 or -10 percentage point, or +10 or +20 percentage point. It would be interesting, however, to find out whether respondents make different choices when being confronted with SDG levels that do not change. This, in combination with a decrease in tax payments, could include new ethical dilemmas for respondents, which might represent real-life SDG considerations better than the current experiment setup.

[1] In fact, one respondent from the policy maker group actually stated that they decided to end the survey due to the limited amount of choice alternatives.

7.4 Policy recommendations

The results of the Discrete Choice Experiment suggest that there are little significant differences between the weights attributed by Dutch citizens to change for the individual SDGs. In other words, citizens barely show any priorities amongst the SDGs. For the Dutch government, this is an interesting finding. From a multilateral/UN perspective, one can conclude that the intention of the SDGs – an integrated package of goals, all of which are attributed equal weight – has clearly come across to citizens. They largely agree that all seventeen SDG areas deserve attention in governmental policies. This makes alterations to governmental policies easier than when citizens have strong SDG preferences, as there is preliminary evidence of a strong public support.

However, the results do indicate that SDG 17 in both the Global South and in the Netherlands seem to be rejected relative to other SDGs. For example: in the case of an increase in SDG 13 in the Netherlands of 1 percentage point, citizens will accept a decrease of SDG 17 in the Netherlands of 2.08 percentage points. This prioritisation is interesting, given the fact that the SDGs form a multilateral policy package, built upon the cooperation between participating countries. It is also interesting from a national perspective, as within the Netherlands, SDG progress stands or falls on the partnerships between government, companies and pro-bono organisations. By rejecting SDG 17 relative to other SDGs, it is exactly this multilateral and national cooperation that is neglected. For the Dutch government, this means two things. First of all, it raises the question as to why Dutch citizens largely follow the UN's rationale behind the SDGs in terms of equal importance, but seem to relatively reject the belief that member states have to put effort into SDG cooperation. It is therefore advised that the government further researches this aversion towards SDG 17, by means of discussions with pro-bono SDG organisations and by means of further public consultation. Secondly, it provides the government with a clear opportunity: educating the Dutch public on the importance of global partnership when it comes to SDG progress.

In terms of the geographical focus regarding SDG progress, the model results for Dutch citizens indicate that, overall, SDG action in the Global South is considered more important than in the Netherlands. Dutch policy makers seem to agree with this prioritisation, which means that there is no danger of friction between the national public and the national government. However, the exploratory literature research in Chapter 2 has shown that SDG action is also necessary in developed countries, including the Netherlands. Thus, it is advised to the Dutch government to not only focus governmental SDG policy on the Global South, but to also target critical areas in the Netherlands.

In terms of WtP, there is preliminary evidence for the Dutch government that citizens are in general willing to pay for SDG improvement – even for SDG 17. The range of WtP levels is €49.43 – €108.57, the former being the WtP for SDG 17 in the Netherlands, the latter for SDG 6 in the Global South. If we were to extend this to the entire population of employed Dutch citizens, it would mean that more than €920 million in tax payments is available for the Dutch government to spend on SDG 6 progress in the Global South. For SDG 17 in the Netherlands this amount is €420 million. However, this finding has to be viewed in the light of the limitations

discussed in Section 7.3. As the levels of WtP might be overestimated, and because the sample is not representative for the entire Dutch population, it is thoughtful to take the given amounts as an upper bound. Future research is advised in order to more accurately determine the exact amounts of available financial means for the Dutch population (more on this future research can be found in Section 7.7).

7.4.1 The relationship between Dutch citizens and policy makers

Like with citizens, the results are indicative of there being little prioritisations amongst the SDGs. To a large extent, policy makers seem to conform to their own belief that the SDGs deserve equal attention. One preference, however, does arise: in the Netherlands, policy makers prefer SDG 15 – life on land – over SDGs 7, 8, and 9 – (a) affordable and clean energy, (b) decent work and economic growth, and (c) industry, innovation and infrastructure. The cluster models acknowledge this preference (at the 10% significance level), by showing that policy makers prefer planet-related SDGs over prosperity-related ones (in the Netherlands). SDGs 7, 8, and 9 are not relatively rejected completely, as no other SDGs are significantly preferred over them. The finding shows that policy makers prioritise the preservation of ecosystems in the Netherlands above economic growth and innovation. An explanation for this might be the current nitrogen situation, which is ruining the biodiversity in the Netherlands and prevents the building of much needed construction projects. It should be noted, however, that citizens do not seem to share this preference. Citizens have shown a preference for planet-related SDGs, but not at the expense of prosperity-related ones. The advice for the Dutch government, therefore, is the following. First of all: determine whether this is the government's official stance. Transparency is key when it comes to the choices being made regarding the SDGs, as several institutions have demanded this transparency. If in fact the government officially decides to prioritise life on land in governmental policies, this should be clearly communicated and motivated towards the Dutch public. Secondly: find ways to cooperate with the public, with pro-bono organisations and with companies given this priority. Not only will this address the previously discussed point regarding the relative rejection of SDG 17 by citizens, it will also create understanding and hopefully support amongst those not advanced by the focus on biodiversity (like infrastructural and industrial companies, and start-ups).

The Dutch government is also advised to take into account the notion of loss aversion. The results provide preliminary evidence that citizens are more loss-averse in the context of SDGs than policy makers, which is a relevant finding to consider in the shaping of governmental SDG policies. It suggests that citizens consider it more important that SDGs do not deteriorate than policy makers do. In the case of a policy measure that causes a slight deterioration of one SDG in order to improve another, the Dutch government can use the finding on citizen loss aversion to reconsider the measure, or to clearly and transparently explain to the public why this measure truly is the preferable option.

When comparing individual SDGs, the results suggest that there are no significant differences between Dutch citizens and policy makers. Citizens deem no SDG more important than policy makers, and vice versa. This is an important finding for the Dutch government, as it means that

both groups are largely on the same page. There is a lot of room for cooperation, and little to no effort – except for the few deviations above – has to be put into getting both groups on the same page. This effort can instead be put into finding ways to work together to speed up SDG progress.

When comparing the effect of the current SDG situation on SDG preferences, and the level of WtP between Dutch citizens and policy makers, no statistically significant differences appear. This means that neither of the study groups finds the current SDG situation more important than the other, or has a higher level of WtP than the other. From this finding, the Dutch government can take away that it does not have to put much effort into convincing citizens that SDGs which are already achieved to a high level still need the extra push to be completely achieved. The reason for this is that the current situation has a relatively small impact on citizens: a 5% increase in the current SDG situation causes a 0.53% reduction in the weight attributed to an SDG change. From the perspective of the citizens, the need to invest in an SDG does not depend on the level to which it has already been achieved.

7.4.2 Explanation for SDG preferences

The research results provide an indication that several respondent characteristics or SDG-related views do or do not influence and/or explain the SDG preferences of citizens and policy makers. These relationships are relevant for the Dutch government, as they can enhance comprehension of the behaviour and can help in understanding how to increase the support for SDG improvement.

First of all, there is indicative evidence that the gender and educational level of Dutch citizens do not have an influence on their SDG preferences. Especially the latter finding is interesting for the Dutch government. It implies that the government does not have to pay special attention to the differences in educational level when compiling public education information on the topic of the SDGs. To find areas to cooperate with citizens, no distinction has to be made between educational levels. This also applies to the gender of citizens. The level of knowledge that citizens have about the SDGs, *does* have an effect on their SDG preferences. For 25% increase in SDG knowledge, nearly a 5% increase in perceived SDG importance is achieved. The respondents in this research have stated that they have a relatively high level of SDG knowledge, which can explain why citizens attribute a significant weight to all SDG changes. However, for the group of citizens that does not know much about the SDGs, it is expected that their perception of the importance of the SDGs will be lower. An opportunity to create wider support amongst citizens would consequently be to undertake public education.

The results suggest a moderate effect of aid optimism: the higher the belief that development aid contributes to growth in countries in the Global South, the higher the weight attributed to SDG change. For a 25% increase in this belief, the SDG weights increase by nearly 8%. In the sample, policy makers have a slightly higher level of aid optimism, which can thus explain the subtle differences in SDG preferences between citizens and policy makers (regarding SDG 17 for citizens and SDGs 7, 8 and 9 for policy makers). The relationship presents an opportunity for the Dutch government. Citizens' perceived importance of SDG change can be increased by administering specific public education, in which the effectiveness of development aid is

explained and emphasised. Campaigns that show citizen proof of what the Dutch government has done for people in countries in the Global South can significantly increase the public support for SDG action.

Two aspects which the Dutch government does not have to act on, are the extent to which individuals believe development aid should be conditional, and the domestic-foreign focus individuals think SDG action should have. The results indicate that both do not have a significant effect on SDG preferences. Even though citizens show a slightly higher desire for aid conditionality, this does not lead to a difference in SDG perceptions. From this the government can deduce that the Dutch population is on the whole willing to help out countries in need of SDG improvement, regardless of their demands for prior requirements. As for the domestic-foreign trade-off, the experiment contains respondents from across the entire spectrum. However, the differing views on the desired geographical focus have not caused any significantly different SDG preferences. Thus, the Dutch government can conclude that the division regarding a domestic-foreign focus should not hamper SDG progress and should not give reason for a lack of support amongst the entire population.

The results also show interesting findings for the policy maker group, with which the Dutch government can act internally in order to speed up SDG progress. First of all, the extent to which policy makers believe that the SDGs are too complex, has a strong influence on SDG preferences. A 25% increase in this belief leads to a 23% reduction in the weight attributed to SDG change. A lot is to be achieved here by the Dutch government. The sample of this research shows that the extent to which policy makers deem the SDGs too complex is low to moderate, a finding that can explain why the SDG support among policy makers is high. However, there is likely to be a group of policy makers that have not been a part of this experiment, but that regard the SDGs more complex than the respondents in this experiment. For this more sceptical group, the importance of achieving the SDGs will be lower. The government can yield a lot of support within its own organisation by taking away this scepticism through internal information and education.

A second indicative finding is that the influence of perceived SDG feasibility on SDG preferences is strong. A 25% increase in the extent to which policy makers believe the SDGs are not feasible, leads to more than a 20% reduction in the weight attributed to SDG change. The same applies here as in the case of SDG complexity; a lot is to be achieved by showing policy makers why the SDGs *are* in fact feasible. Once again, the research sample shows low to moderate levels of disbelief in SDG feasibility. For those outside the sample, however, who do not believe in the feasibility, the importance of SDG change is significantly diminished. To get those policy makers on board and to speed up SDG progress, it is advised to inform and educate them on why and how the SDGs *are* achievable.

7.5 Societal contributions

Societally, the findings of this research give confidence in the relationship between the Dutch public and the Dutch government. Without any knowledge on the SDG prioritisations of both groups, any scenario is possible. For example: that the Dutch government is systematically

prioritising multiple SDGs over others, while Dutch citizens actually show a strong preference for those SDGs that the government deems of lesser importance. The research results, however, show that this (to a great extent) is not the case. The insight which has been gained into the inner workings of the SDG preferences of both citizens and policy makers not only increases confidence between the two parties but also serves to make the government motives more transparent. The participation of policy makers in an SDG choice experiment is societally novel, and shows that the Netherlands is a country in which SDG preferences are out in the open, and are not concealed from the general public.

7.6 Scientific contributions

The findings of this research have filled several gaps in scientific knowledge, the first one being in the domain of the dynamic policy triangle. The dynamic policy triangle was introduced in Chapter 1 as the triple set of mutual relationships between a multinational organ, a national government and a national public. Figure 1.4 displays the position of this research within the dynamic policy triangle. The SDGs – a combined effort brought forth by the UN and national governments – and the preferences of both the national public and the national government of a country (influenced by various factors researched in this thesis) lead to the possible prioritisation of certain SDGs. These prioritisations give rise to policy decisions made by the national government. When looking at this inner working, it becomes clear that the findings of this research predominantly give insight into the relationship between national public and national government. It is, however, conceivable that the findings can be more widely applied to the relationship between a multilateral organ (the UN) and a national government, and between a multilateral organ and a national public – the other two arms of the dynamic policy triangle. To further investigate that working, future research is proposed in Section 7.7.

The second area where this research contributes to new scientific knowledge, is the novel use of DCM in an SDG priority setting context. Academic scholars have pinpointed the probability of priority setting by national governments, and the necessity for mapping these at the national level. In essence, it is possible to do this via a generic ranking exercise, in which respondents are asked to order all SDGs from least to most important. Using the DCM method, however, is more precise in determining SDG preferences as it captures subtle differences, offers the opportunity for investigating the influence of other variables, and represents actual SDG preferences more adequately. While the method is predominantly used in marketing and consumer situations, it has been used in political priority-setting situations before. This research is first in using the method of DCM within the domain of the SDGs. It therefore acts as an example for future research on priority-setting in multilateral policy packages with multiple involved actors.

Thirdly, this research contributes to understanding how views on sustainable development, development aid and other background variables influence SDG preferences. For example, it delves deeply into effects of development aid optimism and the belief to which extent development aid should be conditional. Therefore, the findings of this research are also interesting outside the domain of SDGs, and in the domain of public views on development aid. It shows that these

views are not limited to development aid itself, but also influence other areas of global grand challenges.

7.6.1 Reflection on the case of the Netherlands

As this research was performed for the Netherlands, it is insightful to reflect upon the country's context and to think about the possible consequences of that context for the outcomes of this research. Also, it is valuable to think about the context of other countries, and how *that* context would possibly effect the outcomes of this research. In the introduction in Chapter 1, two distinct characteristics of the Netherlands were discussed: the form of government (participatory democracy) and the economic situation (high-income).

It is likely that the unison between Dutch citizens and policy makers found in this research is due to the fact that the Netherlands is governed by means of a participatory democracy. In such a system, citizens are frequently given the chance to offer their opinion and to express their wishes for the direction and shape of governmental policies. It is conceivable that such a unison might not appear in countries without democracies. In these countries, a select group or individual makes decisions for the entire national public, without this public having the opportunity to voice opinions about the decisions. A probable and well-known consequence of this is that a significant proportion of the national public does not agree with the decisions made by the national government. Thus, in countries without democracies, performing a research like this one might reveal bigger differences in terms of SDG preferences between citizens and policy makers. Also, citizens in such countries might feel like notions of justice and of accountable institutions that operate in favour of the national public are lacking. Therefore, a research like this one might reveal a strong preference for SDG 16 – peace, justice and strong institutions – in the own country.

It is conveivable that the high levels of WtP that have been observed in this research are partly due to fact that the Netherlands is a high-income country. Because a large proportion of Dutch citizens has access to sufficient financial means, it can afford to spend a considerate amount on sustainable development and development aid. When looking at countries with less prosperous economic climates, these results might differ. The WtP values might be lower, as citizens have less to spend and use their income predominantly for the primary necessities of themselves and close relatives. Also, the preference of Dutch citizens for SDG action in the Global South might be different in low-income countries. As less money is available for development aid abroad (if not none at all), financial flows will likely predominantly go towards development in the own country. It is therefore conceivable that SDG 8 – decent work and economic growth – will be strongly preferred by citizens over other SDGs.

7.7 Recommendations for future research

As has been mentioned, this thesis can be seen as a preliminary study which sets an example how to use DCM in an SDG priority-setting context. Given the limitations in Section 7.3, there are

many opportunities for future research. First of all, it is relevant to perform the choice experiment again with a larger sample of citizens and policy makers (provided that more extensive amounts of time and financial resources are available). Additionally, attention should be payed to a representative sample. This means respondents from demographic distributions not significantly different from distributions in the population, and with varying political preferences. For policy makers it means respondents from all ministries and all political parties. This involves different sampling methods than those used in this thesis. Ensuring representativeness will enable the investigation into whether the large standard errors are in fact due to large amounts of variability in the population.

Secondly, it is relevant to perform the choice experiment again with some tweaks in the experiment setup. These include the inclusion of an opt-out alternative, decreases in yearly tax payments, and scenarios in which SDGs do not change. Also, it is interesting to look into a manner in which the Global South can be split up into multiple locations, to see if differences exist between them.

Thirdly, it is scientifically interesting to perform the research for various different countries than the Netherlands. As discussed in Section 7.6.1, the context of a country can potentially have consequences for the results of an SDG preferences research. It is therefore relevant to investigate what these consequences are, the method of DCM being suitable to quantify them. Having a wide palette of country SDG preference data will give a clear overview of global SDG preferences and the differences between countries, and will shine a light on the inner working on the global relationship between national publics and national governments in an SDG context.

Finally, given the other two other arms of the dynamic policy triangle which are unexplored in this research, it can be relevant to see how the findings of this research and of future researches as proposed above will influence the two other arms. This will give insight into the working of national SDG preferences over time. First of all, research could be performed to find out how the findings of national SDG preference consultations influence the relationship between a national public and a multilateral organ (in this case the UN). As mentioned in Chapter 1, citizen views on multilateralism as a concept are anything but unified. It is interesting to investigate how these views change and how the proportion of a national public that is in favour of multilateralism changes due to the increase in SDG preference insights in various countries. On the other hand, it is interesting to investigate how these dynamic views work the other way around; how the goal that multilateral organs have in mind for national publics changes due to a shift in public views on multilateralism. Secondly, it is relevant to find out how the (possibly) changed views as mentioned above will affect the relationship between multilateral organs and national governments. As discussed in Chapter 1, via a membership, a multilateral organ grants collective legitimisation to a national government, justifying certain national policy choices. Research could show how the public acceptation of this collective legitimisation change due to (possible) changed views on multilateralism. Also, future research could provide insights into how the knowledge of national SDG preferences in different countries affects the agreements made between the UN and national governments. In other words: whether and how the nature of multilateral membership changes, and whether and how the nature of multilateral policy packages (in this case the SDGs)

change.

7.8 Relevance within the EPA programme

As this thesis is written for the master's programme of Engineering and Policy Analysis, it is necessary to understand why the research and its findings fit within the programme and are relevant from a EPA perspective. It is clear that the subject of this thesis has a strong link with the so-called global grand challenges. All seventeen SDGs are in some way aimed at working towards tackling one or more of these challenges, and the aim of this research is to find ways in which this can be improved. The research has an analytical disposition; it places the system of SDGs in a larger context − the dynamic policy triangle − and seeks to find data-driven answers to a problem by using a statistically sound analytical modelling tool. The problem is approached using a multi-actor perspective, in which multilateral organs, national governments, citizens and organisations all play a role. From this multi-actor perspective, the gathered information was used to inform decision-makers. In the case of this research, the decision-maker is the Dutch government, which was advised how to interpret the preference results, how to use the results to speed up SDG action, and how to create further harmony and cooperation between government and public.

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Appendix A

Calculation of the tax increase attribute levels

To make a DCM experiment as realistic as possible, the values of attribute levels need to be close to real-life values. This appendix contains a back-of-the-envelope calculation for the amount of tax income needed per tax payer in the Netherlands to fully achieve two of the seventeen SDGs. Per step of the calculation, references are included when sources were used.

1. The total amount of investments needed to fully achieve all SDGs is estimated to be 1.5% to 2.5% of world GDP per year (p/y) (Schmidt-Traub, 2015). This is an average of 2% of world GDP p/y.
2. World GDP (measured in 2017) is approximately $81 trillion (Worldometer, n.d.).
3. Given the euro to dollar exchange rate in 2017, this is approximately €72 trillion (ExchangeRates.org.uk, 2021).
4. The total amount of investments needed to fully achieve all SDGs is thus: 2% of €72 trillion p/y = €1.44 trillion p/y.
5. The share of the Netherlands in world GDP is 1.03% (Worldometer, n.d.).
6. The total amount of investments needed by the Netherlands to fully achieve all SDGs is thus: 1.03% of €1.44 trillion p/y = €15 billion p/y
7. The number of employed individuals in the Netherlands (thus paying taxes) is 8.500.000 (Centraal Bureau voor de Statistiek, n.d.-e).
8. The amount of tax income needed per tax payer in the Netherlands to fully achieve all SDGs is thus: €15 billion p/y divided by 8.500.000 = €1800 p/y (rounded).
9. Finally, the amount of tax income needed per tax payer in the Netherlands to fully achieve two SDGs is: $\frac{2}{17}$ times €1800 p/y = €215 p/y (rounded).

Appendix B

Survey design specification

This appendix contains a detailed description of the eventual DCM experiment setup. It includes the final survey design as was presented to respondents using Qualtrics, a complete list of all experiment attributes, and a log of the number of times all SDGs occurred in the generated choice sets.

B.1 Final full survey design

Given the fact that both study groups have the Dutch nationality, the original survey was written in Dutch. However, for this appendix, the questions have been translated into English. Each question or information block is displayed in a grey box with a title to indicate which question it concerns. This title is merely for clarity, and was not displayed to the respondents.

B.1.1 Introductory information

The introductory information was the first feature that showed up on a respondent's screen, and was presented to all respondents; citizens and policy makers alike. It served the purpose of providing general information about the research purpose, stating the careful handling of respondent data, and giving a very brief illustration of the SDGs.

Introduction

Research into choice behavior Sustainable Development Goals

Dear respondent,

First of all, many thanks for taking part in this survey; your participation is highly appreciated! My graduation research focuses on mapping the choice behaviour of Dutch citizens and Dutch policy makers with regard to the Sustainable Development Goals of the UN (henceforth abbreviated as SDGs). Your answers to the questions in this survey form an essential part of this process, and make it possible to give well-founded advice to the Dutch government in the field of the SDGs.

The survey takes up to a maximum of 15 minutes of your time.

Your participation is completely voluntary, and you are free to end the survey at any time. Your answers will remain completely anonymous, cannot be traced back to you individually, and will only be used for the purposes of this graduation research.

If you have any questions about the research, or are interested in the conclusions that follow, please do not hesitate to contact me.

Kind regards,

Sebastian Maks
Master student Engineering and Policy Analysis - Technical University of Delft
S.J.Maks@student.tudelft.nl

Background information SDGs

The Sustainable Development Goals (SDGs)

Together, the 17 SDGs form a package of goals that strives for a better, more inclusive, more sustainable and safer world by 2030. The goals were adopted in 2015 by all member states of the United Nations (UN), including the Netherlands. They provide a global compass for tackling large-scale challenges such as food scarcity, poverty, education, inequality and climate change. Below is an overview of the 17 SDGs:

B.1.2 Distinguishing study groups

As the research attempts to compare two study groups – citizens and policy makers – it is necessary to somehow distinguish both groups in the data. This was done by asking respondents whether or not they are currently employed as a policy maker.

study group inquiry

Do you work as a policy maker for one of the following authorities?

- A ministry of the Dutch government
- A party fraction of the Dutch Senate or the Dutch House of Representatives

☐ Yes
☐ No

B.1.3 DCM questions

Part one contained all DCM-related questions. It first presented some explanation regarding the experiment setup and research context which respondents should imagine for the choice sets. This explanation and context was also given by means of a self-made info-graphic video.

DCM introduction

Part 1 of 2: choice behaviour

In this part, you will be presented with ten hypothetical choice scenarios. Please imagine the following situation:

Together with all other UN member states, the Dutch government has decided to invest in global SDG progress. All governments together are considering three different policy packages, which should be funded using tax money from all UN member states. The three policy packages affect two SDGs, which either show an improvement or a deterioration compared to the current situation. The policy packages differ in approach from each other and as a result also cost different amounts of money. The question to you is: which policy package do you prefer?

Per scenario the following aspects vary:

- The two SDGs which are influenced by the policy packages
- The countries in which the two SDGs change
- The current situation of the two SDGs in the concerning countries
- The actual change of the two SDGs per policy package
- The costs of the policy packages (on an annual basis)

The respondent was randomly assigned one of the 100 collections (each containing 10 choice sets). Qualtrics automatically routed to this random selection, and assured that every collection was used evenly.

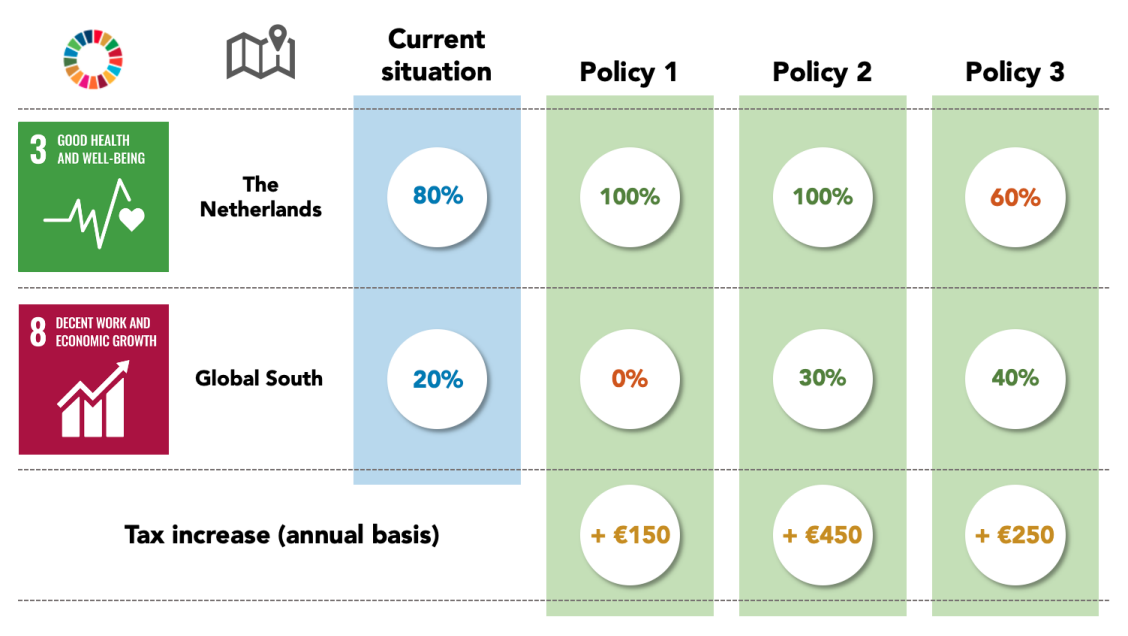
First choice set (example)

Scenario 1 of 10

In this scenario, the intended plans of the Dutch government and all UN member states affect the following 2 SDGs:

SDG 3: Ensure healthy lives and promote well-being for all at all ages.
SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

In this scenario, which policy package do you prefer?



☐ Policy 1
☐ Policy 2
☐ Policy 3

For the sake of clarity, the remaining choice sets have been left out of this appendix. However, each respondent received a total 10 choice sets, meaning that another 9 choice sets followed after the example choice set above.

B.1.4 Additional questions

Part two was different for both study groups. Dependent on the respondent's study group, Qualtrics routed to either questions specifically for citizens, or to questions specifically for policy makers.

Citizen questions

Part 2 of 2: additional questions

In this section, you will be asked to answer some questions regarding your demographics, and your opinion on a number of SDG-related issues.

What gender do you identify with?

☐ Male
☐ Female
☐ Other
☐ I prefer not to say

What is your age?

☐ Younger than 25 years of age
☐ 25-35 years of age
☐ 36-45 years of age
☐ 46-55 years of age
☐ 56-65 years of age
☐ Older than 65 years of age
☐ I prefer not to say

What is your highest level of education?

If you did not follow your education in the Netherlands, please choose the option that most closely resembles the education you have received.

☐ No education
☐ Primary school
☐ Secondary school
☐ Vocational school
☐ University of Applied Sciences
☐ University - bachelor's degree
☐ University - master's degree
☐ Doctorate/PhD
☐ I prefer not to say

Where would you place yourself in the political spectrum?

☐ Progressive-left
☐ Progressive-centre
☐ Progressive-right
☐ Centre-centre
☐ Conservative-left

☐ Conservative-centre
☐ Conservative-right
☐ I prefer not to say

To what extent do you consider yourself informed about the SDGs?

I have never heard about the SDGs ☐ ☐ ☐ ☐ ☐ *I know a lot about the SDGs*

To what extent do you agree with the following statements?

Sustainable development aid administered by the Dutch government to developing countries contributes to growth in those developing countries.

Strongly disagree ☐ ☐ ☐ ☐ ☐ *Strongly agree*

The Dutch government must always set clear conditions when providing sustainable development aid to developing countries.

Strongly disagree ☐ ☐ ☐ ☐ ☐ *Strongly agree*

In the case of investments in SDG progress, should the Dutch government focus this policy mainly on the own country, mainly on other countries, or on a mix between the two?

Own country ☐ ☐ ☐ ☐ ☐ ☐ ☐ *Other countries*

Policy maker questions

Part 2 of 2: additional questions

In this section, you will be asked to answer some questions regarding a number of SDG-related issues.

For which authority do you work?

☐ Ministry of General Affairs
☐ Ministry of Domestic Affairs
☐ Ministry of Foreign Affairs
☐ Ministry of Defence
☐ Ministry of Economic Affairs and Climate
☐ Ministry of Finance
☐ Ministry of Infrastructure and Water Management

☐ Ministry of Agriculture, Nature and Food Quality
☐ Ministry of Education, Culture and Science
☐ Ministry of Social Affairs and Employment
☐ Ministry of Justice and Security
☐ Ministry of Health, Well-being and Sports
☐ Parliamentary group seated in the Dutch Senate
☐ Parliamentary group seated in the Dutch House of Representatives
☐ I prefer not to say

To what extent do you agree with the following statements?

Sustainable development aid administered by the Dutch government to developing countries contributes to growth in those developing countries.

Strongly disagree ☐ ☐ ☐ ☐ ☐ *Strongly agree*

The Dutch government must always set clear conditions when providing sustainable development aid to developing countries.

Strongly disagree ☐ ☐ ☐ ☐ ☐ *Strongly agree*

The 2030 SDG Agenda is too complex.

Strongly disagree ☐ ☐ ☐ ☐ ☐ *Strongly agree*

The 2030 SDG Agenda is not feasible.

Strongly disagree ☐ ☐ ☐ ☐ ☐ *Strongly agree*

COVID-19 has caused (elements of) the SDG-related policy plans of the Dutch government to have changed significantly.

Strongly disagree ☐ ☐ ☐ ☐ ☐ *Strongly agree*

In the case of investments in SDG progress, should the Dutch government focus this policy mainly on the own country, mainly on other countries, or on a mix between the two?

Own country ☐ ☐ ☐ ☐ ☐ ☐ ☐ *Other countries*

B.2 Complete list of experiment attributes

Chapter 4 contained a simplified version of the SDG attributes. Table B.1 shows all SDG attributes, as they require a specification for all seventeen SDGs (except for the tax attribute).

Table B.1: List of all attributes in the DCM experiment

SDG change attributes	SDG location attributes	Current SDG situation attributes	Tax attributes
SDG_1_change	SDG_1_location	SDG_1_current	Tax
SDG_2_change	SDG_2_location	SDG_2_current	
SDG_3_change	SDG_3_location	SDG_3_current	
SDG_4_change	SDG_4_location	SDG_4_current	
SDG_5_change	SDG_5_location	SDG_5_current	
SDG_6_change	SDG_6_location	SDG_6_current	
SDG_7_change	SDG_7_location	SDG_7_current	
SDG_8_change	SDG_8_location	SDG_8_current	
SDG_9_change	SDG_9_location	SDG_9_current	
SDG_10_change	SDG_10_location	SDG_10_current	
SDG_11_change	SDG_11_location	SDG_11_current	
SDG_12_change	SDG_12_location	SDG_12_current	
SDG_13_change	SDG_13_location	SDG_13_current	
SDG_14_change	SDG_14_location	SDG_14_current	
SDG_15_change	SDG_15_location	SDG_15_current	
SDG_16_change	SDG_16_location	SDG_16_current	
SDG_17_change	SDG_17_location	SDG_17_current	

B.3 Number of SDG occurrences in the choice sets

As all choice sets are randomly generated, a potential problem could be that some SDGs occur significantly more frequently than others. Table B.2 serves the purpose of showing that this is not the case, and that all SDGs occur roughly the same amount of times.

Table B.2: Amount of SDG occurrences in the choice sets

SDG	**Amount of occurences**
SDG 1	125
SDG 2	113
SDG 3	118
SDG 4	112
SDG 5	117
SDG 6	114
SDG 7	110
SDG 8	117
SDG 9	114
SDG 10	145
SDG 11	119
SDG 12	105
SDG 13	114
SDG 14	134
SDG 15	112
SDG 16	115
SDG 17	116

Appendix C

Sample results of background variables

This appendix contains respondents' aggregated answers to the survey questions regarding the background variables of the research. As all questions used Likert scales, the aggregated answers are displayed as histograms, visualising the amount of times respondents chose for a certain position within the scale. Figures C.1, C.2, C.3, C.4, C.5 and C.6 show these histograms.

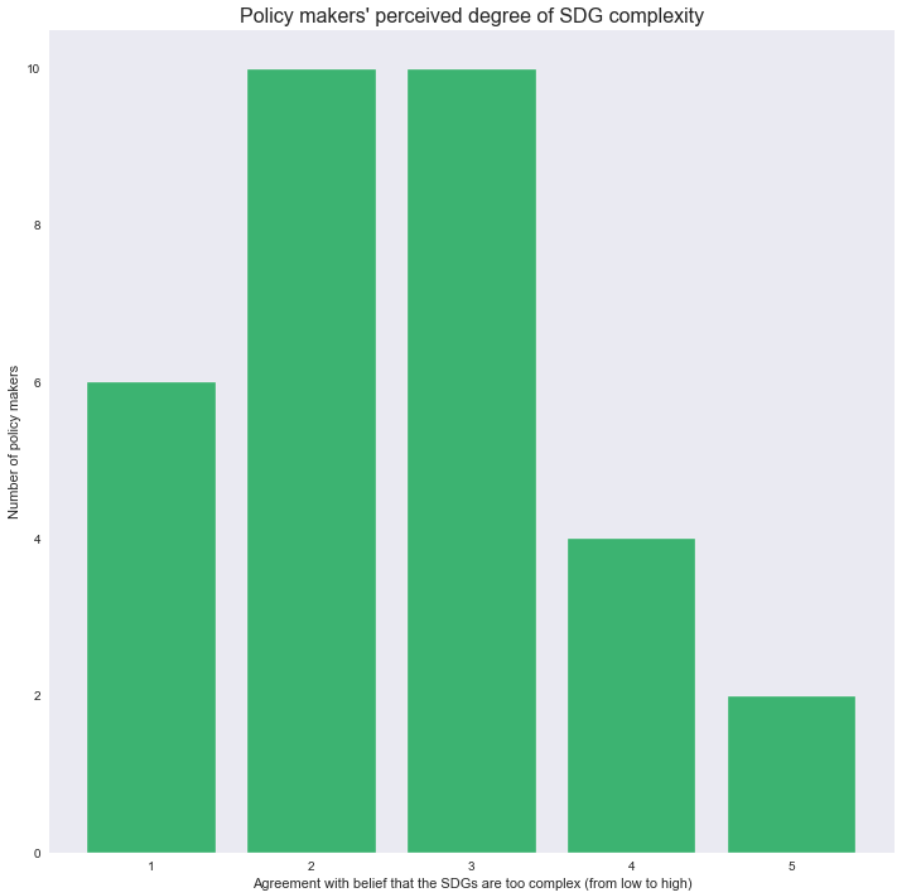


Figure C.1: Level of perceived SDG complexity by policy makers

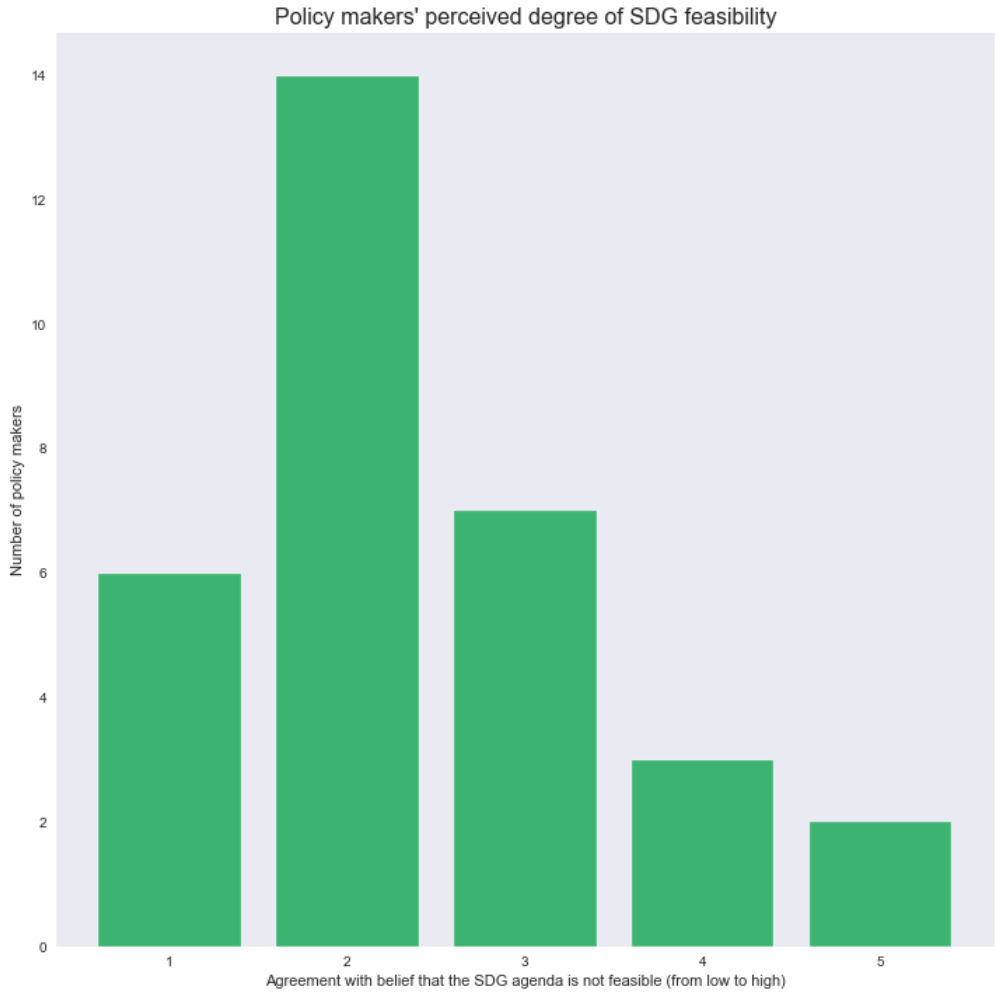


Figure C.2: Level of perceived SDG feasibility by policy makers

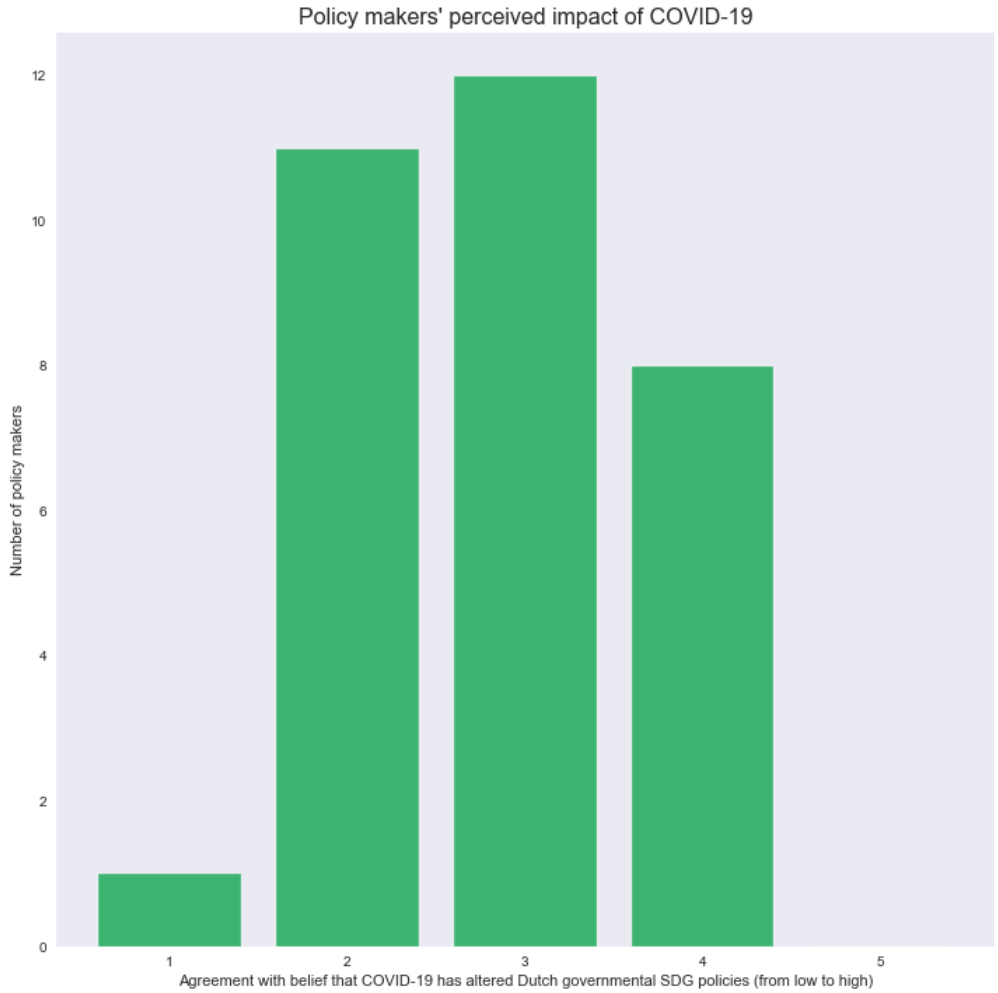


Figure C.3: Level of perceived influence of COVID-19 on government policy by policy makers

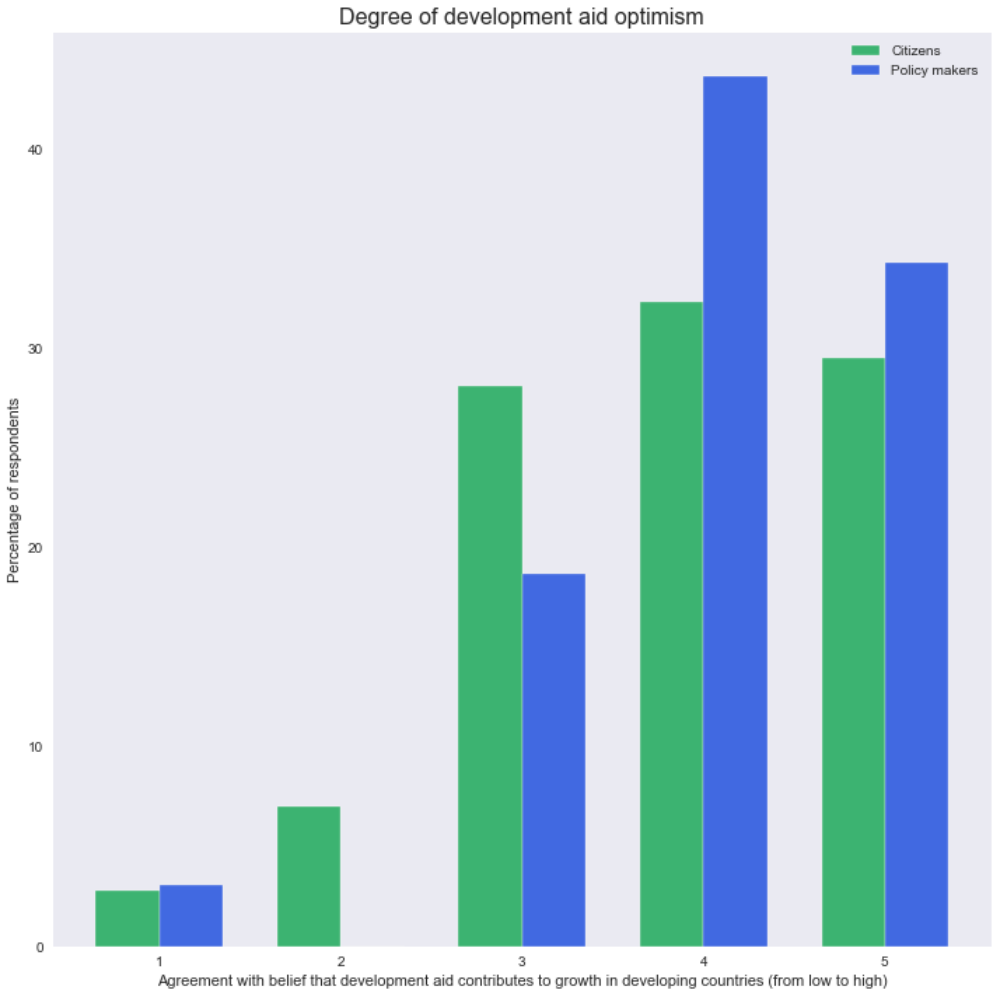


Figure C.4: Level of development aid optimism of both samples

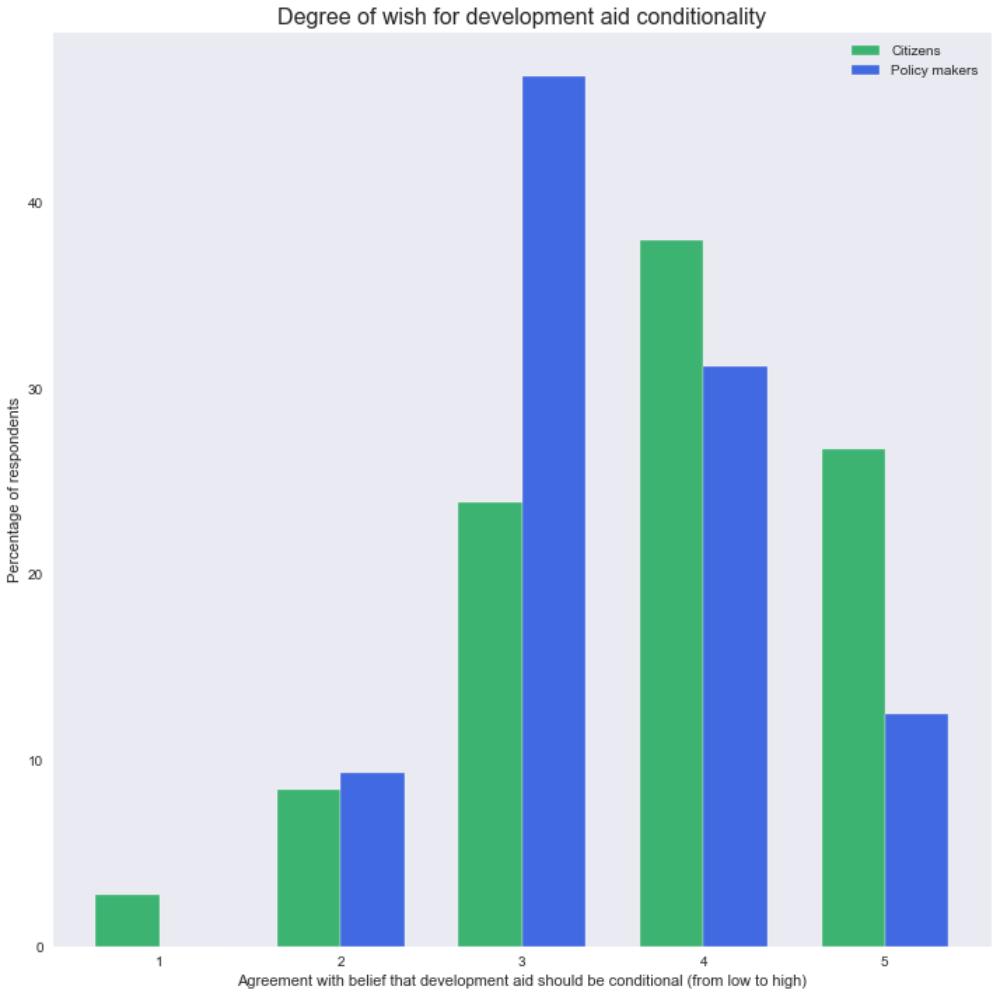


Figure C.5: Level of desired development aid conditionality of both samples

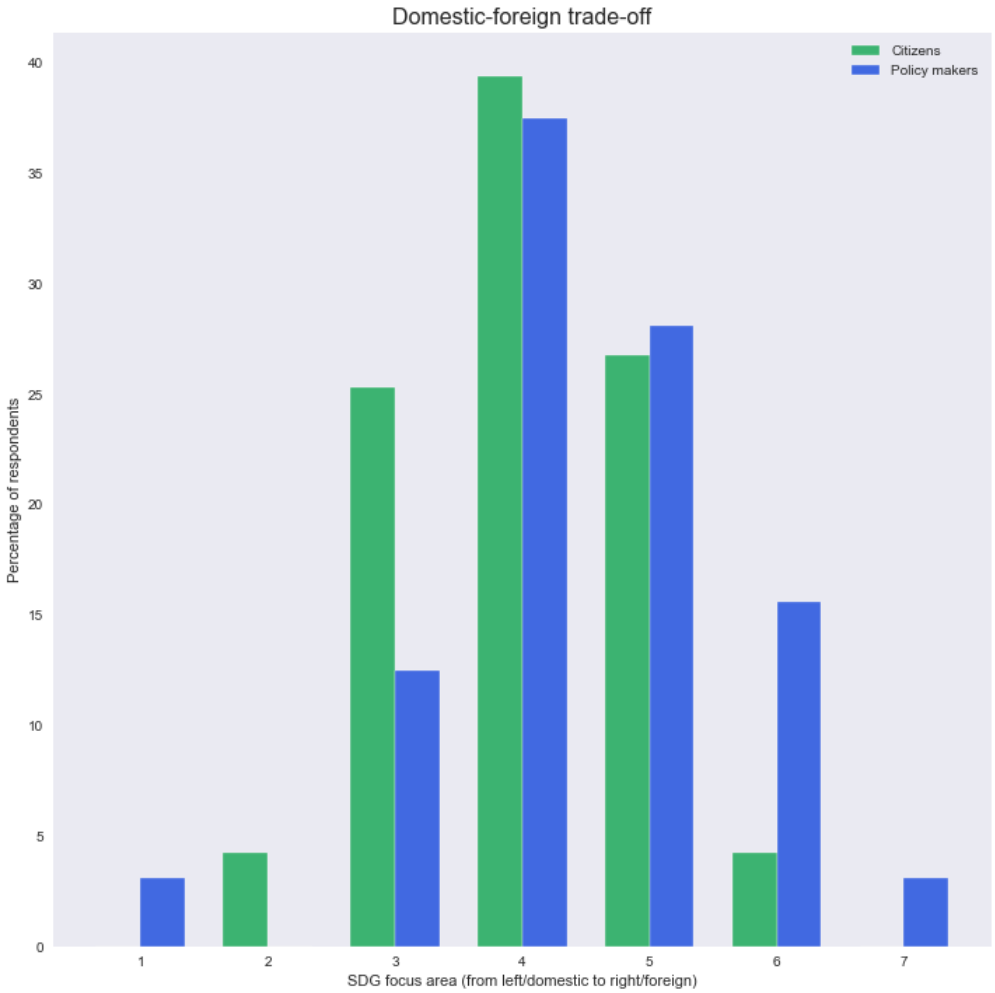


Figure C.6: Position in the domestic-foreign trade-off of both samples

Appendix D

Model estimation results

This appendix contains a detailed log of all performed model estimations. Per estimation, two tables and (for some) one or more figures are provided. The two tables present, respectively: estimation summary results and parameter estimates (accompanied by the standard errors, p-values, and upper and lower bounds of the 95% confidence intervals). The figures present, in one or more formats, visual representations of the parameter estimates, including the 95% confidence intervals. All estimations follow the numbering as presented in Table 5.1.

D.1 Total sample models

The estimations in this section are performed for the total sample; videlicet: the samples of citizens and policy makers combined. In order of appearance, these are the following:

1. A model using the wedding cake theory, with a current situation interaction effect
2. A model using the wedding cake theory, with a current situation interaction effect and a study group interaction effect
3. A model using the 5Ps theory, with a current situation interaction effect
4. A model using the 5Ps theory, with a current situation interaction effect and a study group interaction effect
5. A full-SDG model, without distinguishing locations, with a current situation interaction effect
6. A full-SDG model, with a location interaction effect, with a current situation interaction effect
7. A full-SDG model, with a location interaction effect, with a current situation interaction effect and a study group interaction effect
8. A full-SDG model, with location and loss aversion interaction effects, with a current situation interaction effect

9. A full-SDG model, with location and loss aversion interaction effects, with a current situation interaction effect and a study group interaction effect
10. A full-SDG model split per location, without an incorporation of the current situation
11. A full-SDG model split per location, with an incorporation of the current situation using percentage changes
12. A full-SDG model split per location, with a current situation interaction effect
13. A full-SDG model split per location, without an incorporation of the current situation, including a study group interaction effect
14. A full-SDG model split per location, with a current situation interaction effect and a study group interaction effect
15. A full-SDG model split per location and per SDG increase/decrease, with a current situation interaction effect

1. A model using the wedding cake theory, with a current situation interaction effect

Table D.1: Model estimation summary of the total sample, using the wedding cake theory, with a current situation interaction effect

Estimation variable	Value
Number of estimated parameters:	10
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-999.2053
Likelihood ratio test for the init. model:	328.4501
Rho-square for the init. model:	0.141
Number of iterations:	81
Number of function evaluations:	174
Number of gradient evaluations:	47
Optimization time:	0:00:10.687102

Table D.2: Parameter estimations of the total sample, using the wedding cake theory, with a current situation interaction effect

Parameter	Value	SE	p-value	LB	UB
B_biosphere_GS	9.480e-02	7.750e-03	0.000e+00	7.961e-02	1.100e-01
B_biosphere_NL	9.360e-02	8.200e-03	0.000e+00	7.753e-02	1.097e-01
B_current	-4.150e-04	7.740e-05	8.110e-08	-5.667e-04	-2.633e-04
B_economy_GS	7.940e-02	7.750e-03	0.000e+00	6.421e-02	9.459e-02
B_economy_NL	6.890e-02	7.390e-03	0.000e+00	5.442e-02	8.338e-02
B_partnership_GS	6.230e-02	1.090e-02	1.150e-08	4.094e-02	8.366e-02
B_partnership_NL	4.050e-02	1.010e-02	6.160e-05	2.070e-02	6.030e-02
B_society_GS	8.630e-02	7.220e-03	0.000e+00	7.215e-02	1.005e-01
B_society_NL	7.970e-02	6.710e-03	0.000e+00	6.655e-02	9.285e-02
B_tax	-1.410e-03	4.190e-04	7.350e-04	-2.231e-03	-5.888e-04

2. A model using the wedding cake theory, with a current situation interaction effect and a study group interaction effect

Table D.3: Model estimation summary of the total sample, using the wedding cake theory, with a current situation interaction effect and a study group interaction effect

Estimation variable	Value
Number of estimated parameters:	11
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-998.8184
Likelihood ratio test for the init. model:	329.224
Rho-square for the init. model:	0.141
Number of iterations:	85
Number of function evaluations:	194
Number of gradient evaluations:	55
Optimization time:	0:00:19.584359

Table D.4: Parameter estimations of the total sample, using the wedding cake theory, with a current situation interaction effect and a study group interaction effect

Parameter	Value	SE	p-value	LB	UB
B_biosphere_GS	9.680e-02	8.100e-03	0.000e+00	8.092e-02	1.127e-01
B_biosphere_NL	9.570e-02	8.560e-03	0.000e+00	7.892e-02	1.125e-01
B_current	-4.140e-04	7.740e-05	8.540e-08	-5.657e-04	-2.623e-04
B_economy_GS	8.160e-02	8.160e-03	0.000e+00	6.561e-02	9.759e-02
B_economy_NL	7.110e-02	7.790e-03	0.000e+00	5.583e-02	8.637e-02
B_group	-6.610e-03	7.480e-03	3.770e-01	-2.127e-02	8.051e-03
B_partnership_GS	6.450e-02	1.120e-02	9.070e-09	4.255e-02	8.645e-02
B_partnership_NL	4.220e-02	1.030e-02	4.290e-05	2.201e-02	6.239e-02
B_society_GS	8.840e-02	7.620e-03	0.000e+00	7.346e-02	1.033e-01
B_society_NL	8.190e-02	7.180e-03	0.000e+00	6.783e-02	9.597e-02
B_tax	-1.420e-03	4.190e-04	7.100e-04	-2.241e-03	-5.988e-04

3. A model using the 5Ps theory, with a current situation interaction effect

Table D.5: Model estimation summary of the total sample, using the 5Ps theory, with a current situation interaction effect

Estimation variable	Value
Number of estimated parameters:	12
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-1000.361
Likelihood ratio test for the init. model:	326.1392
Rho-square for the init. model:	0.14
Number of iterations:	105
Number of function evaluations:	214
Number of gradient evaluations:	55
Optimization time:	0:00:14.736207

Table D.6: Parameter estimations of the total sample, using the 5Ps theory, with a current situation interaction effect

Parameter	Value	SE	p-value	LB	UB
B_current	-4.180e-04	7.770e-05	7.590e-08	-5.703e-04	-2.657e-04
B_partnership_GS	6.300e-02	1.090e-02	8.270e-09	4.164e-02	8.436e-02
B_partnership_NL	4.120e-02	1.020e-02	5.080e-05	2.121e-02	6.119e-02
B_peace_GS	8.120e-02	1.310e-02	4.910e-10	5.552e-02	1.069e-01
B_peace_NL	8.420e-02	1.160e-02	3.610e-13	6.146e-02	1.069e-01
B_people_GS	9.000e-02	7.820e-03	0.000e+00	7.467e-02	1.053e-01
B_people_NL	8.070e-02	7.160e-03	0.000e+00	6.667e-02	9.473e-02
B_planet_GS	8.880e-02	7.330e-03	0.000e+00	7.443e-02	1.032e-01
B_planet_NL	9.160e-02	7.860e-03	0.000e+00	7.619e-02	1.070e-01
B_prosperity_GS	8.350e-02	7.730e-03	0.000e+00	6.835e-02	9.865e-02
B_prosperity_NL	6.810e-02	7.150e-03	0.000e+00	5.409e-02	8.211e-02
B_tax	-1.420e-03	4.190e-04	7.020e-04	-2.241e-03	-5.988e-04

4. A model using the 5Ps theory, with a current situation interaction effect and a study group interaction effect

Table D.7: Model estimation summary of the total sample, using the 5Ps theory, with a current situation interaction effect and a study group interaction effect

Estimation variable	Value
Number of estimated parameters:	13
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-999.9926
Likelihood ratio test for the init. model:	326.8756
Rho-square for the init. model:	0.14
Number of iterations:	83
Number of function evaluations:	196
Number of gradient evaluations:	57
Optimization time:	0:00:18.912623

Table D.8: Parameter estimations of the total sample, using the 5Ps theory, with a current situation interaction effect and a study group interaction effect

Parameter	Value	SE	p-value	LB	UB
B_current	-4.170e-04	7.770e-05	7.940e-08	-5.693e-04	-2.647e-04
B_group	-6.450e-03	7.480e-03	3.890e-01	-2.111e-02	8.211e-03
B_partnership_GS	6.520e-02	1.120e-02	6.720e-09	4.325e-02	8.715e-02
B_partnership_NL	4.280e-02	1.040e-02	3.600e-05	2.242e-02	6.318e-02
B_peace_GS	8.300e-02	1.320e-02	3.690e-10	5.713e-02	1.089e-01
B_peace_NL	8.630e-02	1.190e-02	3.300e-13	6.298e-02	1.096e-01
B_people_GS	9.200e-02	8.190e-03	0.000e+00	7.595e-02	1.081e-01
B_people_NL	8.290e-02	7.610e-03	0.000e+00	6.798e-02	9.782e-02
B_planet_GS	9.080e-02	7.710e-03	0.000e+00	7.569e-02	1.059e-01
B_planet_NL	9.360e-02	8.230e-03	0.000e+00	7.747e-02	1.097e-01
B_prosperity_GS	8.570e-02	8.150e-03	0.000e+00	6.973e-02	1.017e-01
B_prosperity_NL	7.020e-02	7.600e-03	0.000e+00	5.530e-02	8.510e-02
B_tax	-1.430e-03	4.190e-04	6.780e-04	-2.251e-03	-6.088e-04

5. A full-SDG model, without distinguishing locations, with a current situation interaction effect

Table D.9: Model estimation summary of the total sample, without distinguishing locations, with a current situation interaction effect

Estimation variable	Value
Number of estimated parameters:	19
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-989.5421
Likelihood ratio test for the init. model:	347.7766
Rho-square for the init. model:	0.149
Number of iterations:	82
Number of function evaluations:	179
Number of gradient evaluations:	49
Optimization time:	0:00:11.750681

Ben-Akiva & Swait test of model 1 (worse fit) and model 5 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 1059 * ln(3) * \frac{(-999 - -990)}{-1163}}\Big) = 1,10 * 10^{-5} \tag{D.1}$$

Table D.10: Parameter estimations of the total sample, without distinguishing locations, with a current situation interaction effect

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_change	7.990e-02	8.530e-03	0.000e+00	6.318e-02	9.662e-02
B_SDG_11_change	6.880e-02	9.300e-03	1.380e-13	5.057e-02	8.703e-02
B_SDG_12_change	7.410e-02	8.920e-03	0.000e+00	5.662e-02	9.158e-02
B_SDG_13_change	1.030e-01	9.730e-03	0.000e+00	8.393e-02	1.221e-01
B_SDG_14_change	8.340e-02	8.670e-03	0.000e+00	6.641e-02	1.004e-01
B_SDG_15_change	1.020e-01	1.000e-02	0.000e+00	8.240e-02	1.216e-01
B_SDG_16_change	8.200e-02	9.630e-03	0.000e+00	6.313e-02	1.009e-01
B_SDG_17_change	5.160e-02	8.300e-03	4.950e-10	3.533e-02	6.787e-02
B_SDG_1_change	7.730e-02	9.000e-03	0.000e+00	5.966e-02	9.494e-02
B_SDG_2_change	9.630e-02	1.020e-02	0.000e+00	7.631e-02	1.163e-01
B_SDG_3_change	9.790e-02	9.540e-03	0.000e+00	7.920e-02	1.166e-01
B_SDG_4_change	9.150e-02	1.020e-02	0.000e+00	7.151e-02	1.115e-01
B_SDG_5_change	7.210e-02	8.680e-03	0.000e+00	5.509e-02	8.911e-02
B_SDG_6_change	9.340e-02	9.500e-03	0.000e+00	7.478e-02	1.120e-01
B_SDG_7_change	8.560e-02	9.900e-03	0.000e+00	6.620e-02	1.050e-01
B_SDG_8_change	8.370e-02	9.340e-03	0.000e+00	6.539e-02	1.020e-01
B_SDG_9_change	6.210e-02	8.780e-03	1.540e-12	4.489e-02	7.931e-02
B_current	-4.290e-04	7.880e-05	5.260e-08	-5.834e-04	-2.746e-04
B_tax	-1.380e-03	4.220e-04	1.100e-03	-2.207e-03	-5.529e-04

6. A full-SDG model, with a location interaction effect, with a current situation interaction effect

Table D.11: Model estimation summary of the total sample, with a location interaction effect, with a current situation interaction effect

Estimation variable	Value
Number of estimated parameters:	20
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-987.316
Likelihood ratio test for the init. model:	352.2287
Rho-square for the init. model:	0.151
Number of iterations:	94
Number of function evaluations:	215
Number of gradient evaluations:	61
Optimization time:	0:00:21.302944

Ben-Akiva & Swait test of model 5 (worse fit) and model 6 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 1059 * ln(3) * \frac{(-990 - -987)}{-1163}}\Big) = 7,14 * 10^{-3} \qquad \text{(D.2)}$$

Table D.12: Parameter estimations of the total sample, with a location interaction effect, with a current situation interaction effect

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_change	8.170e-02	8.580e-03	0.000e+00	6.488e-02	9.852e-02
B_SDG_11_change	6.990e-02	9.360e-03	8.280e-14	5.155e-02	8.825e-02
B_SDG_12_change	7.470e-02	8.970e-03	0.000e+00	5.712e-02	9.228e-02
B_SDG_13_change	1.040e-01	9.770e-03	0.000e+00	8.485e-02	1.231e-01
B_SDG_14_change	8.340e-02	8.700e-03	0.000e+00	6.635e-02	1.005e-01
B_SDG_15_change	1.030e-01	1.000e-02	0.000e+00	8.340e-02	1.226e-01
B_SDG_16_change	8.350e-02	9.700e-03	0.000e+00	6.449e-02	1.025e-01
B_SDG_17_change	5.250e-02	8.300e-03	2.670e-10	3.623e-02	6.877e-02
B_SDG_1_change	7.830e-02	9.010e-03	0.000e+00	6.064e-02	9.596e-02
B_SDG_2_change	9.670e-02	1.020e-02	0.000e+00	7.671e-02	1.167e-01
B_SDG_3_change	9.870e-02	9.570e-03	0.000e+00	7.994e-02	1.175e-01
B_SDG_4_change	9.280e-02	1.030e-02	0.000e+00	7.261e-02	1.130e-01
B_SDG_5_change	7.310e-02	8.690e-03	0.000e+00	5.607e-02	9.013e-02
B_SDG_6_change	9.320e-02	9.530e-03	0.000e+00	7.452e-02	1.119e-01
B_SDG_7_change	8.610e-02	9.960e-03	0.000e+00	6.658e-02	1.056e-01
B_SDG_8_change	8.400e-02	9.340e-03	0.000e+00	6.569e-02	1.023e-01
B_SDG_9_change	6.310e-02	8.830e-03	9.010e-13	4.579e-02	8.041e-02
B_current	-4.330e-04	7.890e-05	4.120e-08	-5.876e-04	-2.784e-04
B_location	3.790e-03	1.800e-03	3.530e-02	2.620e-04	7.318e-03
B_tax	-1.410e-03	4.230e-04	8.530e-04	-2.239e-03	-5.809e-04

7. A full-SDG model, with a location interaction effect, with a current situation interaction effect and a study group interaction effect

Table D.13: Model estimation summary of the total sample, with a location interaction effect, with a current situation interaction effect and a study group interaction effect

Estimation variable	Value
Number of estimated parameters:	21
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-986.7586
Likelihood ratio test for the init. model:	353.3436
Rho-square for the init. model:	0.152
Number of iterations:	94
Number of function evaluations:	219
Number of gradient evaluations:	63
Optimization time:	0:00:29.185239

Table D.14: Parameter estimations of the total sample, with a location interaction effect, with a current situation interaction effect and a study group interaction effect

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_change	8.210e-02	8.610e-03	0.000e+00	6.522e-02	9.898e-02
B_SDG_11_change	7.030e-02	9.380e-03	6.950e-14	5.192e-02	8.868e-02
B_SDG_12_change	7.510e-02	8.990e-03	0.000e+00	5.748e-02	9.272e-02
B_SDG_13_change	1.050e-01	9.820e-03	0.000e+00	8.575e-02	1.242e-01
B_SDG_14_change	8.360e-02	8.710e-03	0.000e+00	6.653e-02	1.007e-01
B_SDG_15_change	1.040e-01	1.000e-02	0.000e+00	8.440e-02	1.236e-01
B_SDG_16_change	8.390e-02	9.720e-03	0.000e+00	6.485e-02	1.030e-01
B_SDG_17_change	5.240e-02	8.310e-03	2.800e-10	3.611e-02	6.869e-02
B_SDG_1_change	7.890e-02	9.010e-03	0.000e+00	6.124e-02	9.656e-02
B_SDG_2_change	9.680e-02	1.020e-02	0.000e+00	7.681e-02	1.168e-01
B_SDG_3_change	9.910e-02	9.590e-03	0.000e+00	8.030e-02	1.179e-01
B_SDG_4_change	9.270e-02	1.030e-02	0.000e+00	7.251e-02	1.129e-01
B_SDG_5_change	7.340e-02	8.680e-03	0.000e+00	5.639e-02	9.041e-02
B_SDG_6_change	9.320e-02	9.520e-03	0.000e+00	7.454e-02	1.119e-01
B_SDG_7_change	8.620e-02	9.970e-03	0.000e+00	6.666e-02	1.057e-01
B_SDG_8_change	8.380e-02	9.340e-03	0.000e+00	6.549e-02	1.021e-01
B_SDG_9_change	6.330e-02	8.850e-03	8.260e-13	4.595e-02	8.065e-02
B_current	-4.330e-04	7.900e-05	4.210e-08	-5.878e-04	-2.782e-04
B_group	4.060e-03	3.850e-03	2.920e-01	-3.486e-03	1.161e-02
B_location	2.510e-03	2.170e-03	2.460e-01	-1.743e-03	6.763e-03
B_tax	-1.440e-03	4.240e-04	7.010e-04	-2.271e-03	-6.090e-04

8. A full-SDG model, with location and loss aversion interaction effects, with a current situation interaction effect

Table D.15: Model estimation summary of the total sample, with location and loss aversion interaction effects, with a current situation interaction effect

Estimation variable	Value
Number of estimated parameters:	21
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-957.6302
Likelihood ratio test for the init. model:	411.6005
Rho-square for the init. model:	0.177
Number of iterations:	93
Number of function evaluations:	212
Number of gradient evaluations:	60
Optimization time:	0:00:28.292483

Ben-Akiva & Swait test of model 6 (worse fit) and model 8 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 1059 * ln(3) * \frac{(-987 - -958)}{-1163}}\Big) = 1,30 * 10^{-14} \qquad \text{(D.3)}$$

Table D.16: Parameter estimations of the total sample, with location and loss aversion interaction effects, with a current situation interaction effect

Parameter	Value	SE	p-value	LB	UB
B_LA	-4.240e-02	5.610e-03	4.090e-14	-5.340e-02	-3.140e-02
B_SDG_10_change	8.420e-02	8.830e-03	0.000e+00	6.689e-02	1.015e-01
B_SDG_11_change	7.200e-02	9.700e-03	1.130e-13	5.299e-02	9.101e-02
B_SDG_12_change	7.850e-02	9.380e-03	0.000e+00	6.012e-02	9.688e-02
B_SDG_13_change	1.080e-01	1.020e-02	0.000e+00	8.801e-02	1.280e-01
B_SDG_14_change	8.600e-02	8.960e-03	0.000e+00	6.844e-02	1.036e-01
B_SDG_15_change	1.050e-01	1.030e-02	0.000e+00	8.481e-02	1.252e-01
B_SDG_16_change	8.410e-02	1.010e-02	2.220e-16	6.430e-02	1.039e-01
B_SDG_17_change	5.110e-02	8.440e-03	1.380e-09	3.456e-02	6.764e-02
B_SDG_1_change	7.870e-02	9.280e-03	0.000e+00	6.051e-02	9.689e-02
B_SDG_2_change	1.030e-01	1.070e-02	0.000e+00	8.203e-02	1.240e-01
B_SDG_3_change	9.980e-02	9.970e-03	0.000e+00	8.026e-02	1.193e-01
B_SDG_4_change	9.920e-02	1.090e-02	0.000e+00	7.784e-02	1.206e-01
B_SDG_5_change	7.500e-02	9.040e-03	0.000e+00	5.728e-02	9.272e-02
B_SDG_6_change	9.760e-02	9.970e-03	0.000e+00	7.806e-02	1.171e-01
B_SDG_7_change	8.810e-02	1.030e-02	0.000e+00	6.791e-02	1.083e-01
B_SDG_8_change	8.640e-02	9.710e-03	0.000e+00	6.737e-02	1.054e-01
B_SDG_9_change	6.300e-02	9.200e-03	7.430e-12	4.497e-02	8.103e-02
B_current	-4.300e-04	8.180e-05	1.500e-07	-5.903e-04	-2.697e-04
B_location	4.360e-03	1.880e-03	2.010e-02	6.752e-04	8.045e-03
B_tax	-1.610e-03	4.310e-04	1.900e-04	-2.455e-03	-7.652e-04

9. A full-SDG model, with location and loss aversion interaction effects, with a current situation interaction effect and a study group interaction effect

Table D.17: Model estimation summary of the total sample, with location and loss aversion interaction effects, with a current situation interaction effect and a study group interaction effect

Estimation variable	Value
Number of estimated parameters:	23
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-954.7253
Likelihood ratio test for the init. model:	417.4102
Rho-square for the init. model:	0.179
Number of iterations:	100
Number of function evaluations:	243
Number of gradient evaluations:	72
Optimization time:	0:00:49.315269

Ben-Akiva & Swait test of model 8 (worse fit) and model 9 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 1059 * ln(3) * \frac{(-958 - -955)}{-1163}}\Big) = 7,14 * 10^{-03} \tag{D.4}$$

Table D.18: Parameter estimations of the total sample, with location and loss aversion interaction effects, with a current situation interaction effect and a study group interaction effect

Parameter	Value	SE	p-value	LB	UB
B_LA	-3.490e-02	6.670e-03	1.710e-07	-4.797e-02	-2.183e-02
B_SDG_10_change	8.470e-02	8.870e-03	0.000e+00	6.731e-02	1.021e-01
B_SDG_11_change	7.290e-02	9.770e-03	8.550e-14	5.375e-02	9.205e-02
B_SDG_12_change	7.920e-02	9.420e-03	0.000e+00	6.074e-02	9.766e-02
B_SDG_13_change	1.100e-01	1.030e-02	0.000e+00	8.981e-02	1.302e-01
B_SDG_14_change	8.690e-02	8.990e-03	0.000e+00	6.928e-02	1.045e-01
B_SDG_15_change	1.060e-01	1.040e-02	0.000e+00	8.562e-02	1.264e-01
B_SDG_16_change	8.540e-02	1.020e-02	0.000e+00	6.541e-02	1.054e-01
B_SDG_17_change	5.110e-02	8.450e-03	1.530e-09	3.454e-02	6.766e-02
B_SDG_1_change	8.030e-02	9.320e-03	0.000e+00	6.203e-02	9.857e-02
B_SDG_2_change	1.040e-01	1.070e-02	0.000e+00	8.303e-02	1.250e-01
B_SDG_3_change	1.010e-01	1.000e-02	0.000e+00	8.140e-02	1.206e-01
B_SDG_4_change	9.970e-02	1.090e-02	0.000e+00	7.834e-02	1.211e-01
B_SDG_5_change	7.570e-02	9.050e-03	0.000e+00	5.796e-02	9.344e-02
B_SDG_6_change	9.880e-02	9.990e-03	0.000e+00	7.922e-02	1.184e-01
B_SDG_7_change	8.860e-02	1.030e-02	0.000e+00	6.841e-02	1.088e-01
B_SDG_8_change	8.690e-02	9.730e-03	0.000e+00	6.783e-02	1.060e-01
B_SDG_9_change	6.360e-02	9.270e-03	6.920e-12	4.543e-02	8.177e-02
B_current	-4.340e-04	8.210e-05	1.260e-07	-5.949e-04	-2.731e-04
B_group_LA	-2.510e-02	1.210e-02	3.750e-02	-4.882e-02	-1.384e-03
B_group_loc	5.370e-03	4.060e-03	1.860e-01	-2.588e-03	1.333e-02
B_location	2.760e-03	2.250e-03	2.200e-01	-1.650e-03	7.170e-03
B_tax	-1.660e-03	4.320e-04	1.270e-04	-2.507e-03	-8.133e-04

10. A full-SDG model split per location, without an incorporation of the current situation

Table D.19: Model estimation summary of the total sample, without current situation

Estimation variable	Value
Number of estimated parameters:	35
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-995.1966
Likelihood ratio test for the init. model:	336.4677
Rho-square for the init. model:	0.145
Number of iterations:	54
Number of function evaluations:	109
Number of gradient evaluations:	28
Optimization time:	0:00:05.234239

Table D.20: Parameter estimations of the total sample, without current situation

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_GS_change	0.078	1.160e-02	1.950e-11	0.055	1.003e-01
B_SDG_10_NL_change	0.046	8.460e-03	4.080e-08	0.030	6.298e-02
B_SDG_11_GS_change	0.044	1.100e-02	7.000e-05	0.022	6.536e-02
B_SDG_11_NL_change	0.051	1.100e-02	4.120e-06	0.029	7.216e-02
B_SDG_12_GS_change	0.049	9.910e-03	7.720e-07	0.030	6.842e-02
B_SDG_12_NL_change	0.062	1.140e-02	5.490e-08	0.039	8.414e-02
B_SDG_13_GS_change	0.084	1.130e-02	8.480e-14	0.062	1.061e-01
B_SDG_13_NL_change	0.077	1.120e-02	8.060e-12	0.055	9.865e-02
B_SDG_14_GS_change	0.061	9.230e-03	4.100e-11	0.043	7.899e-02
B_SDG_14_NL_change	0.065	1.120e-02	7.150e-09	0.043	8.655e-02
B_SDG_15_GS_change	0.074	1.180e-02	2.600e-10	0.051	9.753e-02
B_SDG_15_NL_change	0.087	1.190e-02	2.430e-13	0.064	1.105e-01
B_SDG_16_GS_change	0.057	1.180e-02	1.880e-06	0.033	7.963e-02
B_SDG_16_NL_change	0.060	1.060e-02	1.010e-08	0.040	8.128e-02
B_SDG_17_GS_change	0.043	1.020e-02	3.070e-05	0.023	6.259e-02
B_SDG_17_NL_change	0.021	9.350e-03	2.270e-02	0.003	3.963e-02
B_SDG_1_GS_change	0.068	1.160e-02	5.960e-09	0.045	9.024e-02
B_SDG_1_NL_change	0.046	9.280e-03	7.690e-07	0.028	6.409e-02
B_SDG_2_GS_change	0.071	1.230e-02	8.690e-09	0.047	9.491e-02
B_SDG_2_NL_change	0.074	1.190e-02	5.400e-10	0.050	9.692e-02
B_SDG_3_GS_change	0.085	1.130e-02	5.860e-14	0.063	1.068e-01
B_SDG_3_NL_change	0.072	1.180e-02	8.780e-10	0.049	9.533e-02
B_SDG_4_GS_change	0.066	1.280e-02	2.210e-07	0.041	9.129e-02
B_SDG_4_NL_change	0.072	1.170e-02	1.030e-09	0.049	9.453e-02
B_SDG_5_GS_change	0.056	9.860e-03	1.660e-08	0.036	7.503e-02
B_SDG_5_NL_change	0.048	1.040e-02	3.470e-06	0.028	6.868e-02
B_SDG_6_GS_change	0.081	1.070e-02	3.930e-14	0.060	1.020e-01
B_SDG_6_NL_change	0.055	1.170e-02	2.720e-06	0.032	7.793e-02
B_SDG_7_GS_change	0.070	1.180e-02	4.120e-09	0.046	9.263e-02
B_SDG_7_NL_change	0.059	1.230e-02	1.300e-06	0.035	8.351e-02
B_SDG_8_GS_change	0.063	1.010e-02	4.490e-10	0.043	8.280e-02
B_SDG_8_NL_change	0.053	1.070e-02	9.200e-07	0.032	7.357e-02
B_SDG_9_GS_change	0.047	1.020e-02	3.260e-06	0.027	6.729e-02
B_SDG_9_NL_change	0.033	1.050e-02	1.800e-03	0.012	5.338e-02
B_tax	-0.001	4.230e-04	1.150e-03	-0.002	-5.509e-04

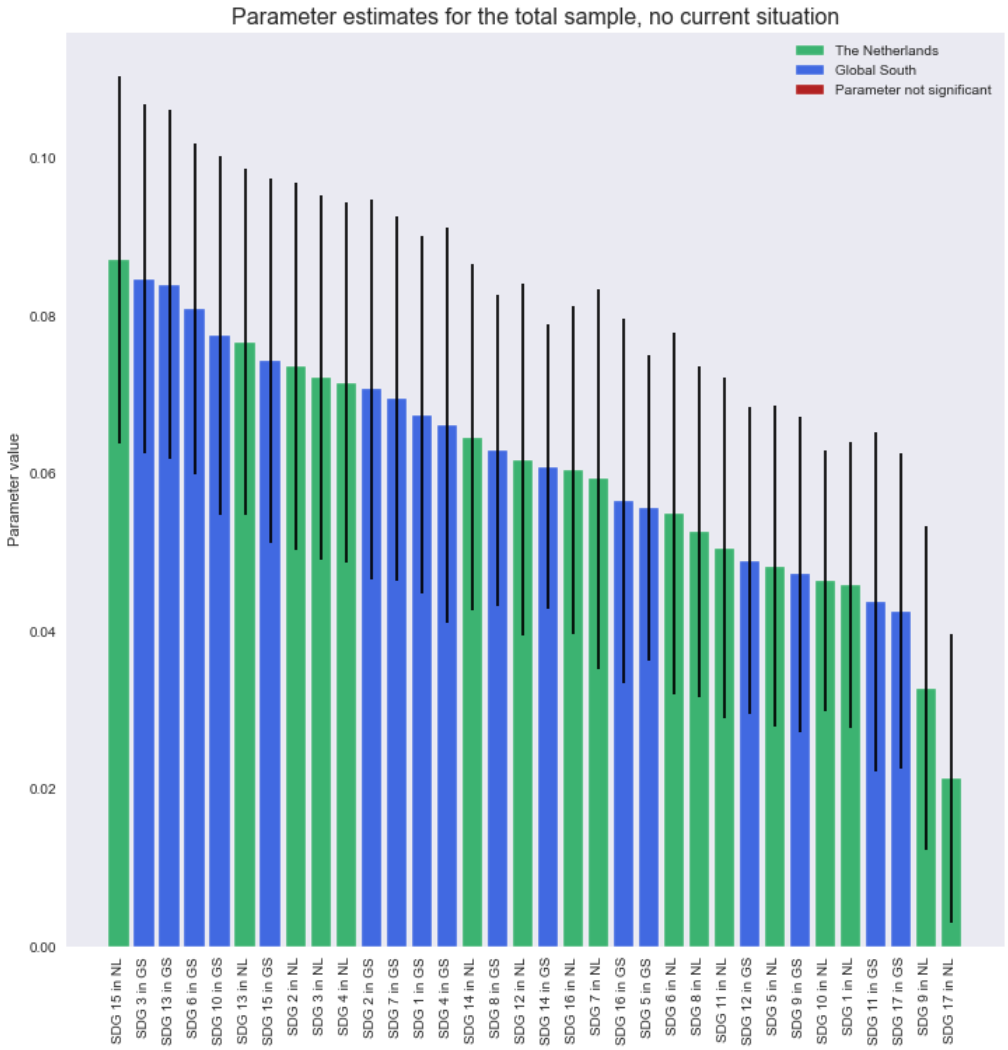


Figure D.1: Visualised parameter estimates of the total sample, without current situation

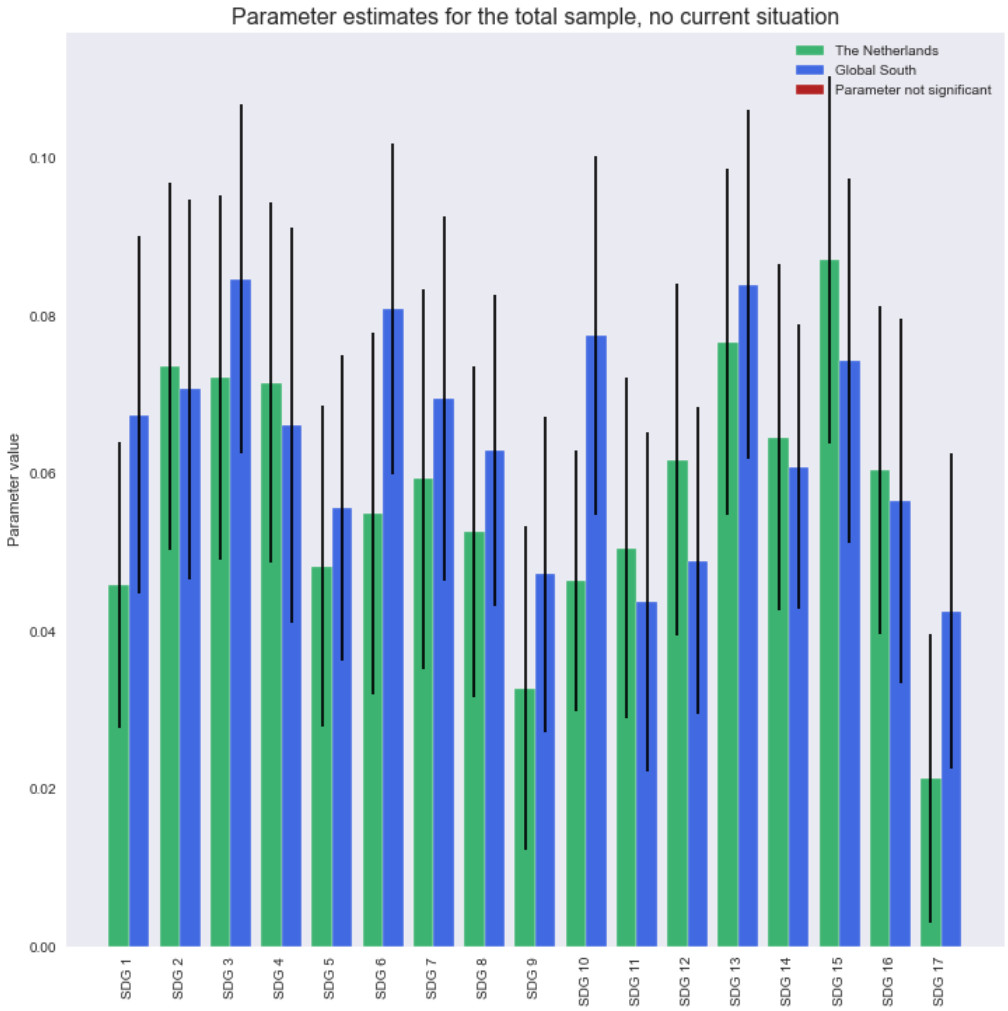


Figure D.2: Visualised parameter estimates of the total sample, without current situation

11. A full-SDG model split per location, with an incorporation of the current situation using percentage changes

Table D.21: Model estimation summary of the total sample, with percentage change current situation

Estimation variable	Value
Number of estimated parameters:	35
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-1030.532
Likelihood ratio test for the init. model:	265.7964
Rho-square for the init. model:	0.114
Number of iterations:	79
Number of function evaluations:	220
Number of gradient evaluations:	71
Optimization time:	0:00:09.170477

Table D.22: Parameter estimations of the total sample, with percentage change current situation

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_GS_change	2.180e+00	4.940e-01	1.040e-05	1.212e+00	3.148
B_SDG_10_NL_change	8.260e-01	2.380e-01	5.330e-04	3.595e-01	1.292
B_SDG_11_GS_change	7.870e-01	3.680e-01	3.230e-02	6.572e-02	1.508
B_SDG_11_NL_change	1.290e+00	3.980e-01	1.170e-03	5.099e-01	2.070
B_SDG_12_GS_change	6.780e-01	2.880e-01	1.850e-02	1.135e-01	1.242
B_SDG_12_NL_change	1.570e+00	4.610e-01	6.690e-04	6.664e-01	2.474
B_SDG_13_GS_change	2.520e+00	5.090e-01	7.500e-07	1.522e+00	3.518
B_SDG_13_NL_change	1.880e+00	3.860e-01	1.140e-06	1.123e+00	2.637
B_SDG_14_GS_change	1.410e+00	3.100e-01	6.000e-06	8.024e-01	2.018
B_SDG_14_NL_change	1.040e+00	3.690e-01	4.800e-03	3.168e-01	1.763
B_SDG_15_GS_change	1.360e+00	4.090e-01	8.670e-04	5.584e-01	2.162
B_SDG_15_NL_change	2.090e+00	4.330e-01	1.390e-06	1.241e+00	2.939
B_SDG_16_GS_change	1.190e+00	4.150e-01	4.020e-03	3.766e-01	2.003
B_SDG_16_NL_change	1.300e+00	3.860e-01	7.700e-04	5.434e-01	2.057
B_SDG_17_GS_change	5.050e-01	2.770e-01	6.870e-02	-3.792e-02	1.048
B_SDG_17_NL_change	3.860e-01	2.760e-01	1.620e-01	-1.550e-01	0.927
B_SDG_1_GS_change	1.710e+00	4.580e-01	1.840e-04	8.123e-01	2.608
B_SDG_1_NL_change	8.740e-01	2.740e-01	1.440e-03	3.370e-01	1.411
B_SDG_2_GS_change	1.690e+00	4.630e-01	2.690e-04	7.825e-01	2.597
B_SDG_2_NL_change	2.160e+00	4.710e-01	4.740e-06	1.237e+00	3.083
B_SDG_3_GS_change	1.740e+00	3.640e-01	1.710e-06	1.027e+00	2.453
B_SDG_3_NL_change	1.650e+00	4.020e-01	4.010e-05	8.621e-01	2.438
B_SDG_4_GS_change	1.990e+00	5.730e-01	5.100e-04	8.669e-01	3.113
B_SDG_4_NL_change	1.760e+00	3.940e-01	8.560e-06	9.878e-01	2.532
B_SDG_5_GS_change	1.210e+00	3.690e-01	1.020e-03	4.868e-01	1.933
B_SDG_5_NL_change	8.210e-01	2.990e-01	5.980e-03	2.350e-01	1.407
B_SDG_6_GS_change	1.520e+00	3.490e-01	1.260e-05	8.360e-01	2.204
B_SDG_6_NL_change	1.810e+00	5.420e-01	8.620e-04	7.477e-01	2.872
B_SDG_7_GS_change	1.950e+00	4.770e-01	4.150e-05	1.015e+00	2.885
B_SDG_7_NL_change	9.120e-01	3.550e-01	1.030e-02	2.162e-01	1.608
B_SDG_8_GS_change	1.550e+00	4.040e-01	1.190e-04	7.582e-01	2.342
B_SDG_8_NL_change	9.320e-01	3.850e-01	1.550e-02	1.774e-01	1.687
B_SDG_9_GS_change	8.640e-01	2.890e-01	2.820e-03	2.976e-01	1.430
B_SDG_9_NL_change	3.180e-01	3.830e-01	4.060e-01	-4.327e-01	1.069
B_tax	3.010e-04	3.730e-04	4.200e-01	-4.301e-04	0.001

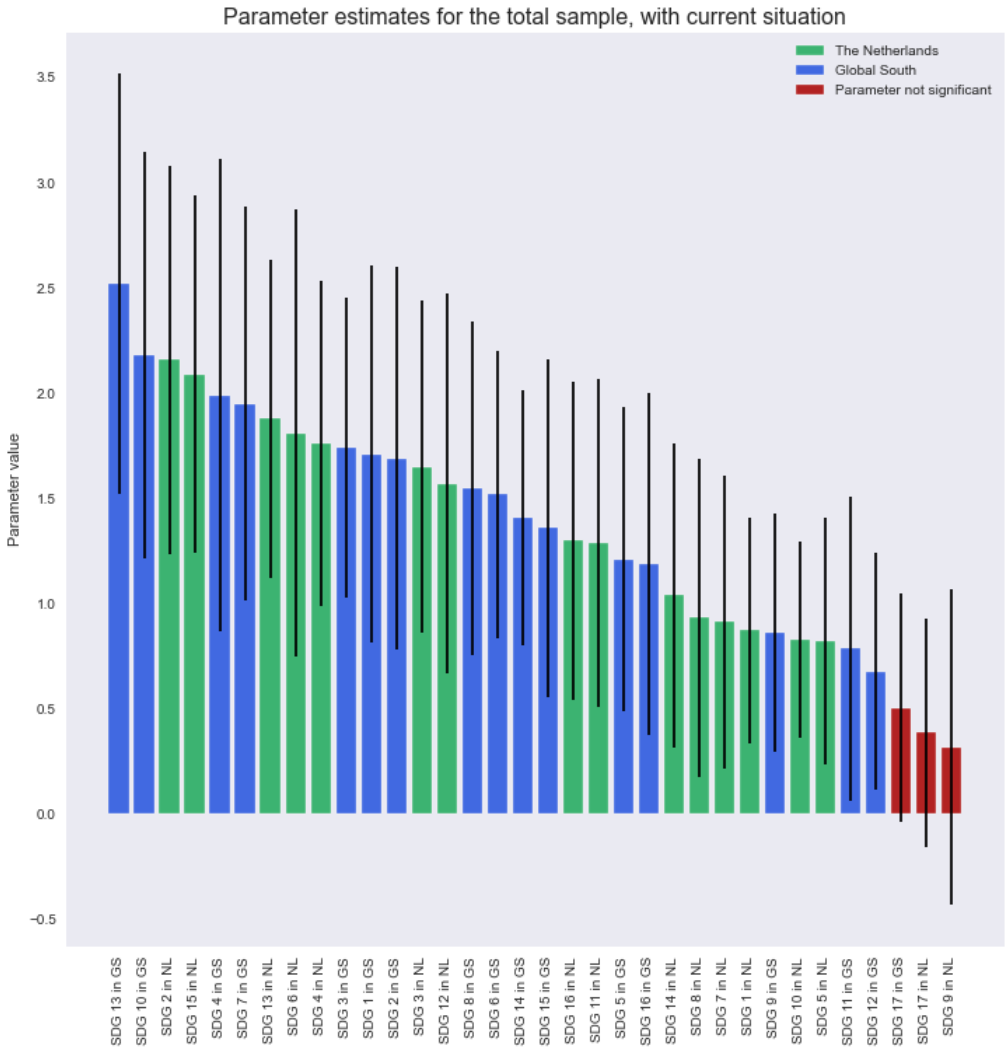


Figure D.3: Visualised parameter estimates of the total sample, with percentage change current situation

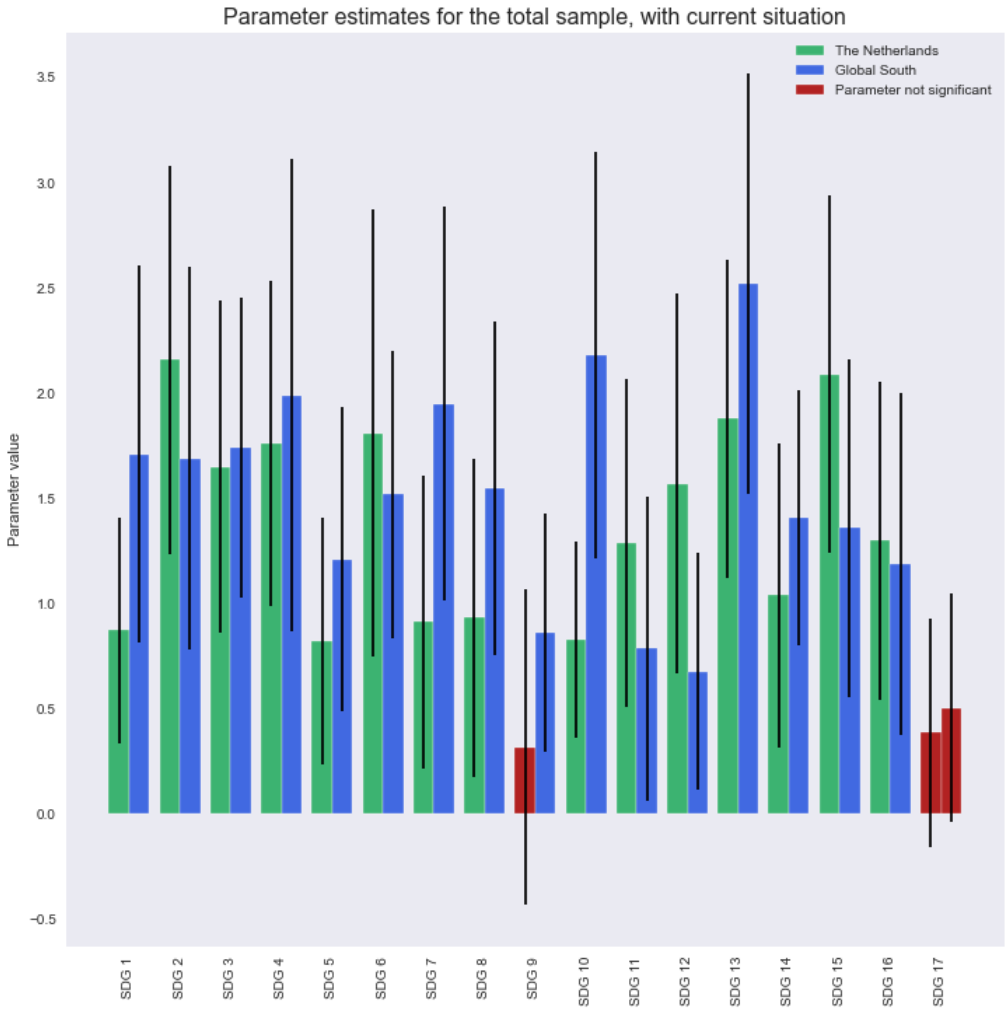


Figure D.4: Visualised parameter estimates of the total sample, with percentage change current situation

12. A full-SDG model split per location, with a current situation interaction effect

Table D.23: Model estimation summary of the total sample, with interaction current situation

Estimation variable	Value
Number of estimated parameters:	36
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-979.3883
Likelihood ratio test for the init. model:	368.0841
Rho-square for the init. model:	0.158
Number of iterations:	81
Number of function evaluations:	176
Number of gradient evaluations:	48
Optimization time:	0:00:17.228780

Table D.24: Parameter estimations of total sample, with interaction current situation

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_GS_change	1.050e-01	1.290e-02	4.440e-16	7.972e-02	1.303e-01
B_SDG_10_NL_change	6.820e-02	9.510e-03	7.140e-13	4.956e-02	8.684e-02
B_SDG_11_GS_change	6.760e-02	1.210e-02	2.440e-08	4.388e-02	9.132e-02
B_SDG_11_NL_change	7.510e-02	1.210e-02	4.950e-10	5.138e-02	9.882e-02
B_SDG_12_GS_change	6.980e-02	1.070e-02	8.050e-11	4.883e-02	9.077e-02
B_SDG_12_NL_change	8.710e-02	1.250e-02	3.350e-12	6.260e-02	1.116e-01
B_SDG_13_GS_change	1.100e-01	1.270e-02	0.000e+00	8.511e-02	1.349e-01
B_SDG_13_NL_change	1.020e-01	1.230e-02	0.000e+00	7.789e-02	1.261e-01
B_SDG_14_GS_change	8.490e-02	1.040e-02	2.220e-16	6.452e-02	1.053e-01
B_SDG_14_NL_change	8.620e-02	1.210e-02	1.290e-12	6.248e-02	1.099e-01
B_SDG_15_GS_change	9.890e-02	1.280e-02	1.330e-14	7.381e-02	1.240e-01
B_SDG_15_NL_change	1.120e-01	1.310e-02	0.000e+00	8.632e-02	1.377e-01
B_SDG_16_GS_change	8.290e-02	1.320e-02	3.510e-10	5.703e-02	1.088e-01
B_SDG_16_NL_change	8.660e-02	1.180e-02	2.460e-13	6.347e-02	1.097e-01
B_SDG_17_GS_change	6.390e-02	1.100e-02	7.130e-09	4.234e-02	8.546e-02
B_SDG_17_NL_change	4.310e-02	1.030e-02	2.920e-05	2.291e-02	6.329e-02
B_SDG_1_GS_change	9.290e-02	1.280e-02	4.080e-13	6.781e-02	1.180e-01
B_SDG_1_NL_change	6.910e-02	1.030e-02	2.260e-11	4.891e-02	8.929e-02
B_SDG_2_GS_change	9.760e-02	1.340e-02	3.680e-13	7.134e-02	1.239e-01
B_SDG_2_NL_change	9.830e-02	1.290e-02	2.820e-14	7.302e-02	1.236e-01
B_SDG_3_GS_change	1.030e-01	1.200e-02	0.000e+00	7.948e-02	1.265e-01
B_SDG_3_NL_change	9.700e-02	1.310e-02	1.210e-13	7.132e-02	1.227e-01
B_SDG_4_GS_change	9.450e-02	1.430e-02	3.940e-11	6.647e-02	1.225e-01
B_SDG_4_NL_change	9.320e-02	1.240e-02	6.350e-14	6.890e-02	1.175e-01
B_SDG_5_GS_change	8.000e-02	1.100e-02	3.920e-13	5.844e-02	1.016e-01
B_SDG_5_NL_change	6.910e-02	1.120e-02	6.770e-10	4.715e-02	9.105e-02
B_SDG_6_GS_change	1.020e-01	1.150e-02	0.000e+00	7.946e-02	1.245e-01
B_SDG_6_NL_change	8.420e-02	1.330e-02	2.210e-10	5.813e-02	1.103e-01
B_SDG_7_GS_change	9.360e-02	1.290e-02	3.580e-13	6.832e-02	1.189e-01
B_SDG_7_NL_change	8.040e-02	1.290e-02	4.290e-10	5.512e-02	1.057e-01
B_SDG_8_GS_change	9.140e-02	1.150e-02	2.440e-15	6.886e-02	1.139e-01
B_SDG_8_NL_change	7.930e-02	1.220e-02	7.400e-11	5.539e-02	1.032e-01
B_SDG_9_GS_change	6.950e-02	1.100e-02	2.660e-10	4.794e-02	9.106e-02
B_SDG_9_NL_change	5.740e-02	1.160e-02	8.220e-07	3.466e-02	8.014e-02
B_current	-4.440e-04	8.020e-05	3.210e-08	-6.012e-04	-2.868e-04
B_tax	-1.440e-03	4.280e-04	7.690e-04	-2.279e-03	-6.011e-04

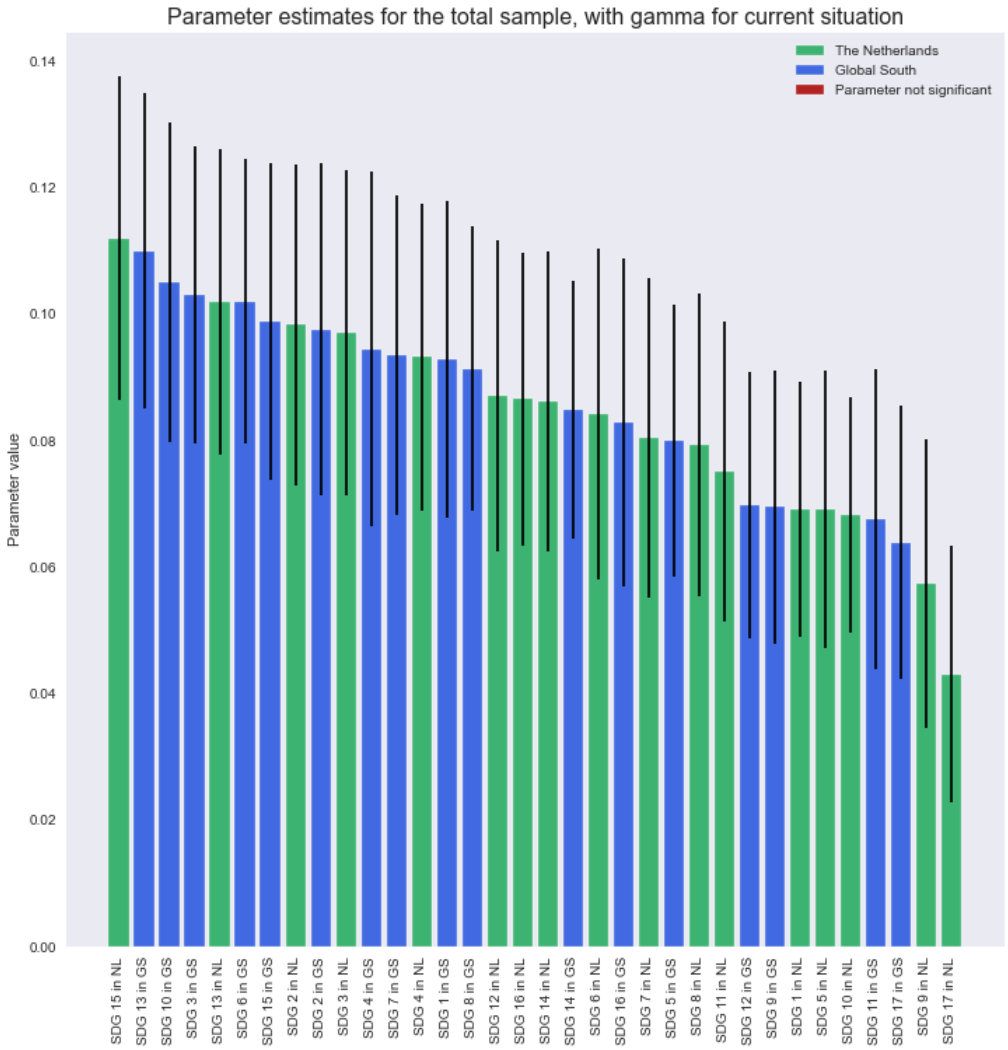


Figure D.5: Visualised parameter estimates of total sample, with interaction current situation

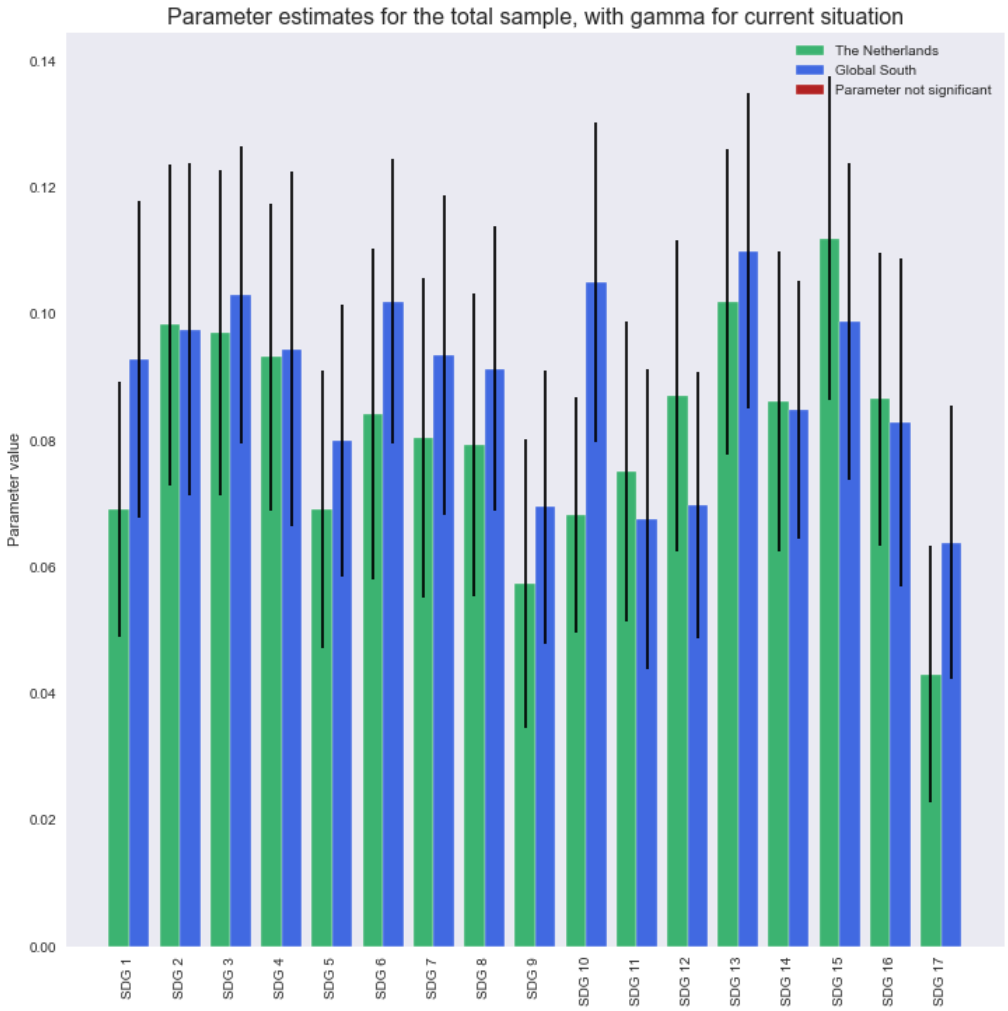


Figure D.6: Visualised parameter estimates of total sample, with interaction current situation

13. A full-SDG model split per location, without an incorporation of the current situation,including a study group interaction effect

Table D.25: Model estimation summary of the total sample, without an incorporation of the current situation,including a study group interaction effect

Estimation variable	Value
Number of estimated parameters:	36
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-994.7775
Likelihood ratio test for the init. model:	337.3057
Rho-square for the init. model:	0.145
Number of iterations:	63
Number of function evaluations:	134
Number of gradient evaluations:	36
Optimization time:	0:00:12.845900

Table D.26: Parameter estimations of the total sample, without an incorporation of the current situation,including a study group interaction effect

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_GS_change	0.080	1.190e-02	1.630e-11	0.057	1.034e-01
B_SDG_10_NL_change	0.049	8.800e-03	3.340e-08	0.031	6.585e-02
B_SDG_11_GS_change	0.046	1.140e-02	4.780e-05	0.024	6.854e-02
B_SDG_11_NL_change	0.053	1.130e-02	2.700e-06	0.031	7.515e-02
B_SDG_12_GS_change	0.051	1.020e-02	5.500e-07	0.031	7.119e-02
B_SDG_12_NL_change	0.064	1.160e-02	3.980e-08	0.041	8.654e-02
B_SDG_13_GS_change	0.086	1.150e-02	7.820e-14	0.064	1.087e-01
B_SDG_13_NL_change	0.079	1.150e-02	6.760e-12	0.056	1.015e-01
B_SDG_14_GS_change	0.063	9.580e-03	4.270e-11	0.044	8.198e-02
B_SDG_14_NL_change	0.067	1.140e-02	5.040e-09	0.045	8.924e-02
B_SDG_15_GS_change	0.076	1.200e-02	1.980e-10	0.053	9.992e-02
B_SDG_15_NL_change	0.089	1.220e-02	2.020e-13	0.066	1.134e-01
B_SDG_16_GS_change	0.059	1.210e-02	1.300e-06	0.035	8.232e-02
B_SDG_16_NL_change	0.063	1.090e-02	7.660e-09	0.041	8.416e-02
B_SDG_17_GS_change	0.045	1.050e-02	2.030e-05	0.024	6.548e-02
B_SDG_17_NL_change	0.023	9.580e-03	1.580e-02	0.004	4.188e-02
B_SDG_1_GS_change	0.070	1.180e-02	4.250e-09	0.046	9.263e-02
B_SDG_1_NL_change	0.048	9.640e-03	5.650e-07	0.029	6.709e-02
B_SDG_2_GS_change	0.073	1.260e-02	5.720e-09	0.049	9.790e-02
B_SDG_2_NL_change	0.076	1.220e-02	4.380e-10	0.052	1.000e-01
B_SDG_3_GS_change	0.087	1.160e-02	5.620e-14	0.064	1.098e-01
B_SDG_3_NL_change	0.075	1.210e-02	6.640e-10	0.051	9.842e-02
B_SDG_4_GS_change	0.069	1.310e-02	1.630e-07	0.043	9.448e-02
B_SDG_4_NL_change	0.074	1.200e-02	7.280e-10	0.050	9.732e-02
B_SDG_5_GS_change	0.058	1.010e-02	1.240e-08	0.038	7.730e-02
B_SDG_5_NL_change	0.051	1.070e-02	2.340e-06	0.030	7.157e-02
B_SDG_6_GS_change	0.083	1.100e-02	3.380e-14	0.062	1.047e-01
B_SDG_6_NL_change	0.057	1.200e-02	1.830e-06	0.034	8.082e-02
B_SDG_7_GS_change	0.072	1.210e-02	2.880e-09	0.048	9.532e-02
B_SDG_7_NL_change	0.062	1.260e-02	8.660e-07	0.037	8.650e-02
B_SDG_8_GS_change	0.065	1.030e-02	3.500e-10	0.045	8.509e-02
B_SDG_8_NL_change	0.055	1.100e-02	6.490e-07	0.033	7.656e-02
B_SDG_9_GS_change	0.050	1.050e-02	2.240e-06	0.029	7.048e-02
B_SDG_9_NL_change	0.035	1.090e-02	1.160e-03	0.014	5.676e-02
B_group	-0.007	7.580e-03	3.580e-01	-0.022	7.887e-03
B_tax	-0.001	4.230e-04	1.100e-03	-0.002	-5.509e-04

14. A full-SDG model split per location, with a current situation interaction effect and a study group interaction effect

Table D.27: Model estimation summary of the total sample, with a current situation interaction effect and a study group interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-979.029
Likelihood ratio test for the init. model:	368.8029
Rho-square for the init. model:	0.158
Number of iterations:	90
Number of function evaluations:	213
Number of gradient evaluations:	62
Optimization time:	0:00:32.196686

Table D.28: Parameter estimations of the total sample, with a current situation interaction effect and a study group interaction effect

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_GS_change	1.070e-01	1.320e-02	4.440e-16	8.113e-02	1.329e-01
B_SDG_10_NL_change	7.020e-02	9.800e-03	8.030e-13	5.099e-02	8.941e-02
B_SDG_11_GS_change	6.970e-02	1.240e-02	1.900e-08	4.540e-02	9.400e-02
B_SDG_11_NL_change	7.730e-02	1.240e-02	3.910e-10	5.300e-02	1.016e-01
B_SDG_12_GS_change	7.190e-02	1.100e-02	7.320e-11	5.034e-02	9.346e-02
B_SDG_12_NL_change	8.890e-02	1.270e-02	2.780e-12	6.401e-02	1.138e-01
B_SDG_13_GS_change	1.120e-01	1.300e-02	0.000e+00	8.652e-02	1.375e-01
B_SDG_13_NL_change	1.040e-01	1.250e-02	0.000e+00	7.950e-02	1.285e-01
B_SDG_14_GS_change	8.700e-02	1.070e-02	4.440e-16	6.603e-02	1.080e-01
B_SDG_14_NL_change	8.830e-02	1.240e-02	1.080e-12	6.400e-02	1.126e-01
B_SDG_15_GS_change	1.010e-01	1.310e-02	1.200e-14	7.532e-02	1.267e-01
B_SDG_15_NL_change	1.140e-01	1.340e-02	0.000e+00	8.774e-02	1.403e-01
B_SDG_16_GS_change	8.480e-02	1.340e-02	2.680e-10	5.854e-02	1.111e-01
B_SDG_16_NL_change	8.870e-02	1.210e-02	2.260e-13	6.498e-02	1.124e-01
B_SDG_17_GS_change	6.600e-02	1.130e-02	5.900e-09	4.385e-02	8.815e-02
B_SDG_17_NL_change	4.480e-02	1.050e-02	2.090e-05	2.422e-02	6.538e-02
B_SDG_1_GS_change	9.460e-02	1.300e-02	3.240e-13	6.912e-02	1.201e-01
B_SDG_1_NL_change	7.130e-02	1.070e-02	2.330e-11	5.033e-02	9.227e-02
B_SDG_2_GS_change	9.980e-02	1.370e-02	2.880e-13	7.295e-02	1.267e-01
B_SDG_2_NL_change	1.010e-01	1.320e-02	2.930e-14	7.513e-02	1.269e-01
B_SDG_3_GS_change	1.060e-01	1.230e-02	0.000e+00	8.189e-02	1.301e-01
B_SDG_3_NL_change	9.920e-02	1.340e-02	1.060e-13	7.294e-02	1.255e-01
B_SDG_4_GS_change	9.700e-02	1.460e-02	3.540e-11	6.838e-02	1.256e-01
B_SDG_4_NL_change	9.510e-02	1.270e-02	5.460e-14	7.021e-02	1.200e-01
B_SDG_5_GS_change	8.170e-02	1.120e-02	3.410e-13	5.975e-02	1.037e-01
B_SDG_5_NL_change	7.120e-02	1.150e-02	5.630e-10	4.866e-02	9.374e-02
B_SDG_6_GS_change	1.040e-01	1.170e-02	0.000e+00	8.107e-02	1.269e-01
B_SDG_6_NL_change	8.630e-02	1.350e-02	1.720e-10	5.984e-02	1.128e-01
B_SDG_7_GS_change	9.570e-02	1.310e-02	3.130e-13	7.002e-02	1.214e-01
B_SDG_7_NL_change	8.250e-02	1.310e-02	3.290e-10	5.682e-02	1.082e-01
B_SDG_8_GS_change	9.320e-02	1.180e-02	2.440e-15	7.007e-02	1.163e-01
B_SDG_8_NL_change	8.150e-02	1.250e-02	6.360e-11	5.700e-02	1.060e-01
B_SDG_9_GS_change	7.190e-02	1.140e-02	2.420e-10	4.956e-02	9.424e-02
B_SDG_9_NL_change	5.980e-02	1.200e-02	6.130e-07	3.628e-02	8.332e-02
B_current	-4.430e-04	8.020e-05	3.390e-08	-6.002e-04	-2.858e-04
B_group	-6.480e-03	7.610e-03	3.950e-01	-2.140e-02	8.436e-03
B_tax	-1.450e-03	4.280e-04	7.370e-04	-2.289e-03	-6.111e-04

15. A full-SDG model split per location and per SDG increase/decrease, with a current situation interaction effect

Table D.29: Model estimation summary of the total sample, split per location and per SDG increase/decrease, with a current situation interaction effect

Estimation variable	Value
Number of estimated parameters:	70
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-932.8166
Likelihood ratio test for the init. model:	461.2276
Rho-square for the init. model:	0.198
Number of iterations:	80
Number of function evaluations:	181
Number of gradient evaluations:	51
Optimization time:	0:00:36.607632

Ben-Akiva & Swait test of model 8 (worse fit) and model 9 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 1059 * ln(3) * \frac{(-955 - -933)}{-1163}}\Big) = 1,63 * 10^{-11} \tag{D.5}$$

Table D.30: Parameter estimations of the total sample, split per location and per SDG increase/decrease, with a current situation interaction effect

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_GS_decrease	1.840e-01	3.730e-02	8.850e-07	1.109e-01	2.571e-01
B_SDG_10_GS_increase	4.290e-02	3.630e-02	2.380e-01	-2.825e-02	1.140e-01
B_SDG_10_NL_decrease	1.170e-01	2.870e-02	4.260e-05	6.075e-02	1.733e-01
B_SDG_10_NL_increase	2.580e-02	2.830e-02	3.620e-01	-2.967e-02	8.127e-02
B_SDG_11_GS_decrease	9.900e-02	3.460e-02	4.230e-03	3.118e-02	1.668e-01
B_SDG_11_GS_increase	4.490e-02	3.480e-02	1.970e-01	-2.331e-02	1.131e-01
B_SDG_11_NL_decrease	1.160e-01	3.430e-02	7.410e-04	4.877e-02	1.832e-01
B_SDG_11_NL_increase	4.520e-02	4.050e-02	2.650e-01	-3.418e-02	1.246e-01
B_SDG_12_GS_decrease	1.140e-01	3.580e-02	1.470e-03	4.383e-02	1.842e-01
B_SDG_12_GS_increase	3.710e-02	3.390e-02	2.740e-01	-2.934e-02	1.035e-01
B_SDG_12_NL_decrease	1.140e-01	3.910e-02	3.540e-03	3.736e-02	1.906e-01
B_SDG_12_NL_increase	7.120e-02	3.850e-02	6.480e-02	-4.260e-03	1.467e-01
B_SDG_13_GS_decrease	7.330e-02	3.770e-02	5.170e-02	-5.920e-04	1.472e-01
B_SDG_13_GS_increase	1.520e-01	3.590e-02	2.220e-05	8.164e-02	2.224e-01
B_SDG_13_NL_decrease	1.150e-01	3.580e-02	1.310e-03	4.483e-02	1.852e-01
B_SDG_13_NL_increase	1.010e-01	3.830e-02	8.110e-03	2.593e-02	1.761e-01
B_SDG_14_GS_decrease	1.540e-01	3.080e-02	5.450e-07	9.363e-02	2.144e-01
B_SDG_14_GS_increase	2.490e-02	3.020e-02	4.090e-01	-3.429e-02	8.409e-02
B_SDG_14_NL_decrease	1.560e-01	3.580e-02	1.240e-05	8.583e-02	2.262e-01
B_SDG_14_NL_increase	2.460e-02	3.770e-02	5.140e-01	-4.929e-02	9.849e-02
B_SDG_15_GS_decrease	1.780e-01	3.850e-02	3.990e-06	1.025e-01	2.535e-01
B_SDG_15_GS_increase	3.470e-02	3.870e-02	3.700e-01	-4.115e-02	1.106e-01
B_SDG_15_NL_decrease	1.820e-01	3.940e-02	3.940e-06	1.048e-01	2.592e-01
B_SDG_15_NL_increase	4.470e-02	3.930e-02	2.550e-01	-3.233e-02	1.217e-01
B_SDG_16_GS_decrease	1.210e-01	3.740e-02	1.200e-03	4.770e-02	1.943e-01
B_SDG_16_GS_increase	4.980e-02	3.760e-02	1.850e-01	-2.390e-02	1.235e-01
B_SDG_16_NL_decrease	1.410e-01	3.490e-02	5.270e-05	7.260e-02	2.094e-01
B_SDG_16_NL_increase	3.860e-02	3.510e-02	2.720e-01	-3.020e-02	1.074e-01
B_SDG_17_GS_decrease	1.240e-01	3.360e-02	2.220e-04	5.814e-02	1.899e-01
B_SDG_17_GS_increase	5.220e-03	3.390e-02	8.780e-01	-6.122e-02	7.166e-02
B_SDG_17_NL_decrease	2.230e-02	3.340e-02	5.050e-01	-4.316e-02	8.776e-02
B_SDG_17_NL_increase	7.090e-02	3.580e-02	4.760e-02	7.320e-04	1.411e-01
B_SDG_1_GS_decrease	1.180e-01	3.430e-02	5.790e-04	5.077e-02	1.852e-01
B_SDG_1_GS_increase	7.280e-02	3.740e-02	5.130e-02	-5.040e-04	1.461e-01
B_SDG_1_NL_decrease	1.640e-01	3.490e-02	2.730e-06	9.560e-02	2.324e-01
B_SDG_1_NL_increase	-1.980e-02	3.300e-02	5.490e-01	-8.448e-02	4.488e-02
B_SDG_2_GS_decrease	1.940e-01	4.260e-02	5.020e-06	1.105e-01	2.775e-01
B_SDG_2_GS_increase	1.660e-02	3.830e-02	6.650e-01	-5.847e-02	9.167e-02
B_SDG_2_NL_decrease	1.110e-01	4.010e-02	5.750e-03	3.240e-02	1.896e-01
B_SDG_2_NL_increase	1.010e-01	3.640e-02	5.500e-03	2.966e-02	1.723e-01
B_SDG_3_GS_decrease	1.360e-01	3.590e-02	1.580e-04	6.564e-02	2.064e-01
B_SDG_3_GS_increase	7.970e-02	3.950e-02	4.360e-02	2.280e-03	1.571e-01
B_SDG_3_NL_decrease	1.650e-01	3.870e-02	2.000e-05	8.915e-02	2.409e-01
B_SDG_3_NL_increase	3.600e-02	3.870e-02	3.530e-01	-3.985e-02	1.119e-01
B_SDG_4_GS_decrease	1.630e-01	4.390e-02	2.000e-04	7.696e-02	2.490e-01
B_SDG_4_GS_increase	4.300e-02	4.060e-02	2.890e-01	-3.658e-02	1.226e-01
B_SDG_4_NL_decrease	1.360e-01	3.810e-02	3.550e-04	6.132e-02	2.107e-01
B_SDG_4_NL_increase	6.260e-02	3.790e-02	9.910e-02	-1.168e-02	1.369e-01

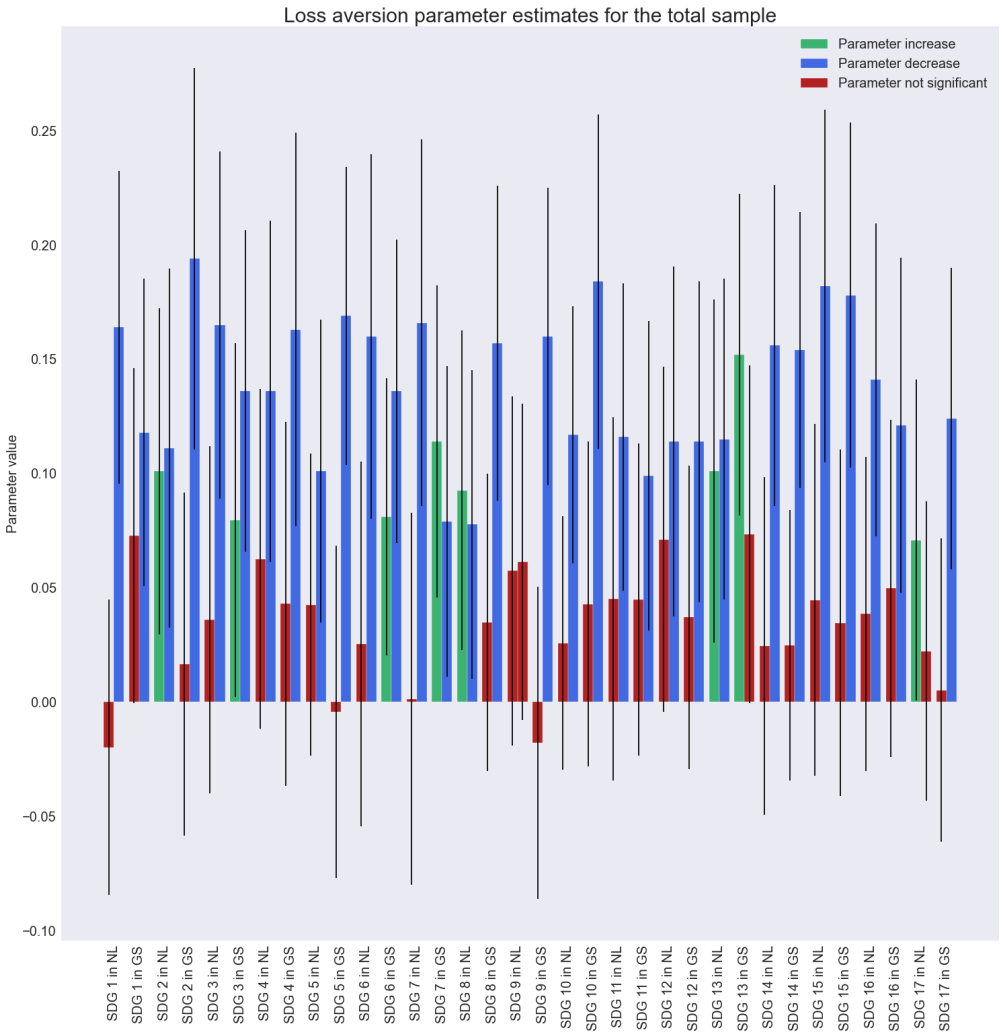


Figure D.7: Visualised parameter estimates of the total sample, split per location and per SDG increase/decrease, with a current situation interaction effect

D.2 Citizen sample models

The estimations in this section are performed for the sample of Dutch citizens. In order of appearance, these are the following:

16. A model using the wedding cake theory, with a current situation interaction effect
17. A model using the 5Ps theory, with a current situation interaction effect
18. A full-SDG model, without distinguishing locations, with a current situation interaction effect

19. A full-SDG model split per location, with a current situation interaction effect
20. A full-SDG model split per location and per SDG increase/decrease, with a current situation interaction effect

16. A model using the wedding cake theory, with a current situation interaction effect

Table D.31: Model estimation summary of the citizen sample, with wedding cake clustering

Estimation variable	Value
Number of estimated parameters:	10
Sample size:	734
Excluded observations:	0
Init log likelihood:	-806.3814
Final log likelihood:	-688.9043
Likelihood ratio test for the init. model:	234.9542
Rho-square for the init. model:	0.146
Number of iterations:	82
Number of function evaluations:	181
Number of gradient evaluations:	50
Optimization time:	0:00:08.632967

Table D.32: Parameter estimations of the citizen sample, with wedding cake clustering

Parameter	Value	SE	p-value	LB	UB
B_biosphere_GS	9.970e-02	9.340e-03	0.000e+00	8.139e-02	1.180e-01
B_biosphere_NL	9.250e-02	9.910e-03	0.000e+00	7.308e-02	1.119e-01
B_current	-4.660e-04	9.560e-05	1.080e-06	-6.534e-04	-2.786e-04
B_economy_GS	8.210e-02	9.500e-03	0.000e+00	6.348e-02	1.007e-01
B_economy_NL	7.460e-02	9.150e-03	4.440e-16	5.667e-02	9.253e-02
B_partnership_GS	5.090e-02	1.340e-02	1.440e-04	2.464e-02	7.716e-02
B_partnership_NL	5.040e-02	1.190e-02	2.310e-05	2.708e-02	7.372e-02
B_society_GS	8.710e-02	8.710e-03	0.000e+00	7.003e-02	1.042e-01
B_society_NL	8.380e-02	8.300e-03	0.000e+00	6.753e-02	1.001e-01
B_tax	-1.100e-03	5.040e-04	2.860e-02	-2.088e-03	-1.122e-04

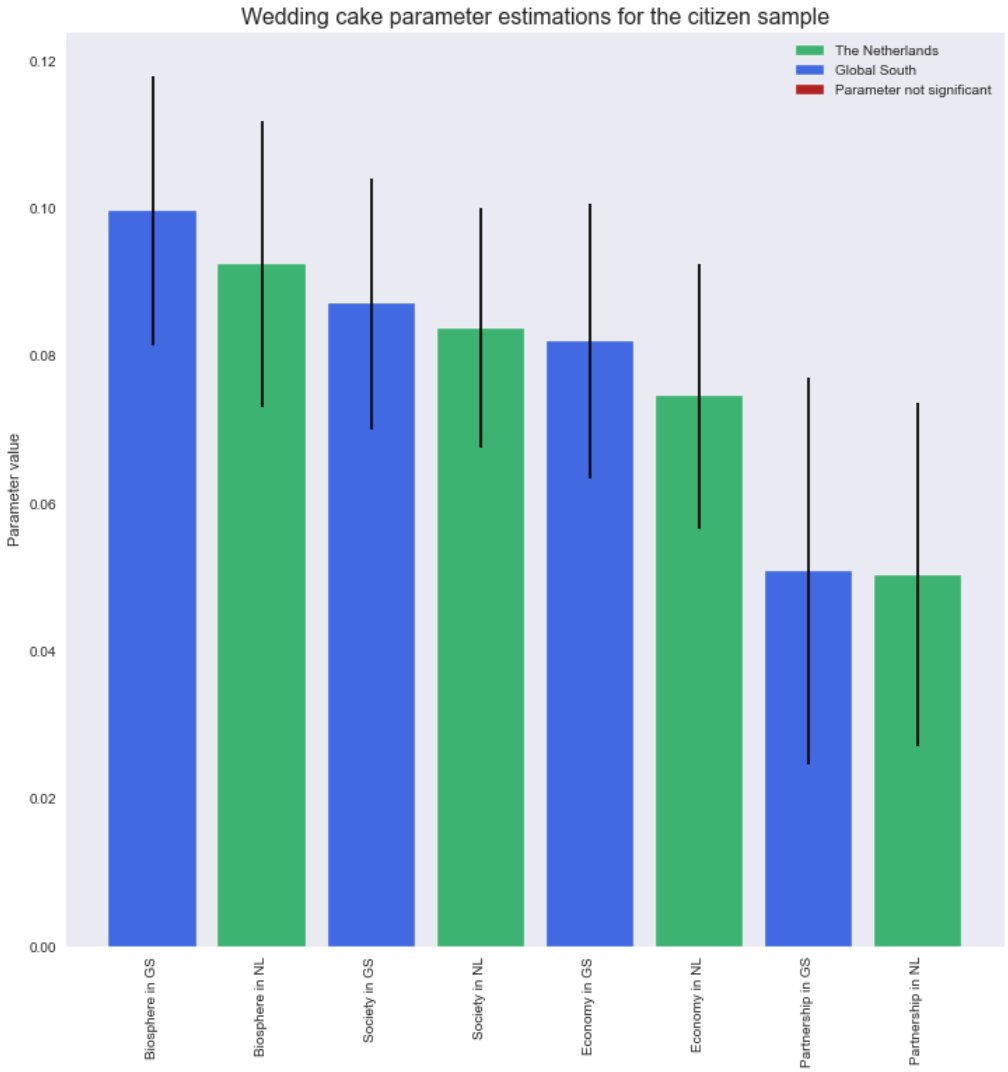


Figure D.8: Visualised parameter estimates of the citizen sample, with wedding cake clustering

17. A model using the 5Ps theory, with a current situation interaction effect

Table D.33: Model estimation summary of the citizen sample, with 5Ps clustering

Estimation variable	Value
Number of estimated parameters:	12
Sample size:	734
Excluded observations:	0
Init log likelihood:	-806.3814
Final log likelihood:	-690.8395
Likelihood ratio test for the init. model:	231.0839
Rho-square for the init. model:	0.143
Number of iterations:	83
Number of function evaluations:	188
Number of gradient evaluations:	53
Optimization time:	0:00:08.191692

Table D.34: Parameter estimations of the citizen sample, with 5Ps clustering

Parameter	Value	SE	p-value	LB	UB
B_current	-4.620e-04	9.640e-05	1.650e-06	-6.509e-04	-2.731e-04
B_partnership_GS	5.110e-02	1.340e-02	1.390e-04	2.484e-02	7.736e-02
B_partnership_NL	5.130e-02	1.200e-02	1.870e-05	2.778e-02	7.482e-02
B_peace_GS	8.620e-02	1.550e-02	2.720e-08	5.582e-02	1.166e-01
B_peace_NL	7.720e-02	1.360e-02	1.470e-08	5.054e-02	1.039e-01
B_people_GS	8.970e-02	9.370e-03	0.000e+00	7.133e-02	1.081e-01
B_people_NL	8.340e-02	8.840e-03	0.000e+00	6.607e-02	1.007e-01
B_planet_GS	9.440e-02	8.880e-03	0.000e+00	7.700e-02	1.118e-01
B_planet_NL	8.980e-02	9.480e-03	0.000e+00	7.122e-02	1.084e-01
B_prosperity_GS	8.230e-02	9.470e-03	0.000e+00	6.374e-02	1.009e-01
B_prosperity_NL	7.700e-02	8.910e-03	0.000e+00	5.954e-02	9.446e-02
B_tax	-1.110e-03	5.040e-04	2.750e-02	-2.098e-03	-1.222e-04

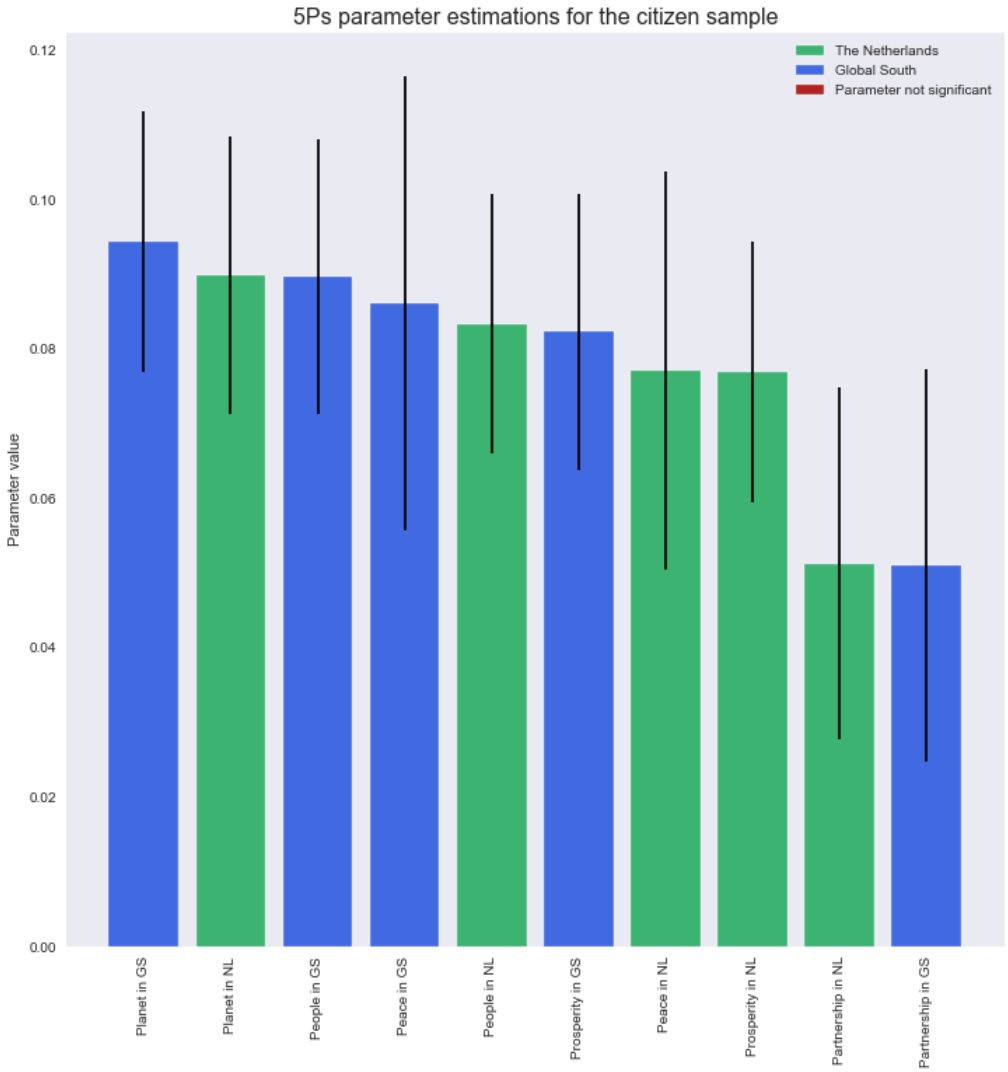


Figure D.9: Visualised parameter estimates of the citizen sample, with 5Ps clustering

18. A full-SDG model, without distinguishing locations, with a current situation interaction effect

Table D.35: Model estimation summary of the citizen sample, without location effect

Estimation variable	Value
Number of estimated parameters:	19
Sample size:	734
Excluded observations:	0
Init log likelihood:	-806.3814
Final log likelihood:	-680.601
Likelihood ratio test for the init. model:	251.5609
Rho-square for the init. model:	0.156
Number of iterations:	85
Number of function evaluations:	190
Number of gradient evaluations:	53
Optimization time:	0:00:09.805610

Ben-Akiva & Swait test of model 16 (worse fit) and model 18 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 734 * ln(3) * \frac{(-689 - -681)}{-806}}\Big) = 3,15 * 10^{-5} \tag{D.6}$$

Table D.36: Parameter estimations of the citizen sample, without location effect

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_change	7.560e-02	1.000e-02	4.330e-14	5.600e-02	9.520e-02
B_SDG_11_change	7.150e-02	1.160e-02	6.690e-10	4.876e-02	9.424e-02
B_SDG_12_change	8.070e-02	1.090e-02	1.080e-13	5.934e-02	1.021e-01
B_SDG_13_change	1.070e-01	1.150e-02	0.000e+00	8.446e-02	1.295e-01
B_SDG_14_change	8.670e-02	1.070e-02	4.440e-16	6.573e-02	1.077e-01
B_SDG_15_change	9.540e-02	1.180e-02	6.660e-16	7.227e-02	1.185e-01
B_SDG_16_change	8.210e-02	1.160e-02	1.610e-12	5.936e-02	1.048e-01
B_SDG_17_change	5.190e-02	9.930e-03	1.740e-07	3.244e-02	7.136e-02
B_SDG_1_change	7.700e-02	1.070e-02	6.630e-13	5.603e-02	9.797e-02
B_SDG_2_change	1.000e-01	1.260e-02	1.330e-15	7.530e-02	1.247e-01
B_SDG_3_change	9.550e-02	1.160e-02	2.220e-16	7.276e-02	1.182e-01
B_SDG_4_change	9.770e-02	1.230e-02	2.440e-15	7.359e-02	1.218e-01
B_SDG_5_change	7.790e-02	1.070e-02	3.650e-13	5.693e-02	9.887e-02
B_SDG_6_change	1.040e-01	1.170e-02	0.000e+00	8.107e-02	1.269e-01
B_SDG_7_change	9.800e-02	1.210e-02	6.660e-16	7.428e-02	1.217e-01
B_SDG_8_change	9.410e-02	1.200e-02	4.000e-15	7.058e-02	1.176e-01
B_SDG_9_change	6.920e-02	1.130e-02	1.040e-09	4.705e-02	9.135e-02
B_current	-4.770e-04	9.740e-05	9.570e-07	-6.679e-04	-2.861e-04
B_tax	-1.090e-03	5.110e-04	3.360e-02	-2.092e-03	-8.844e-05

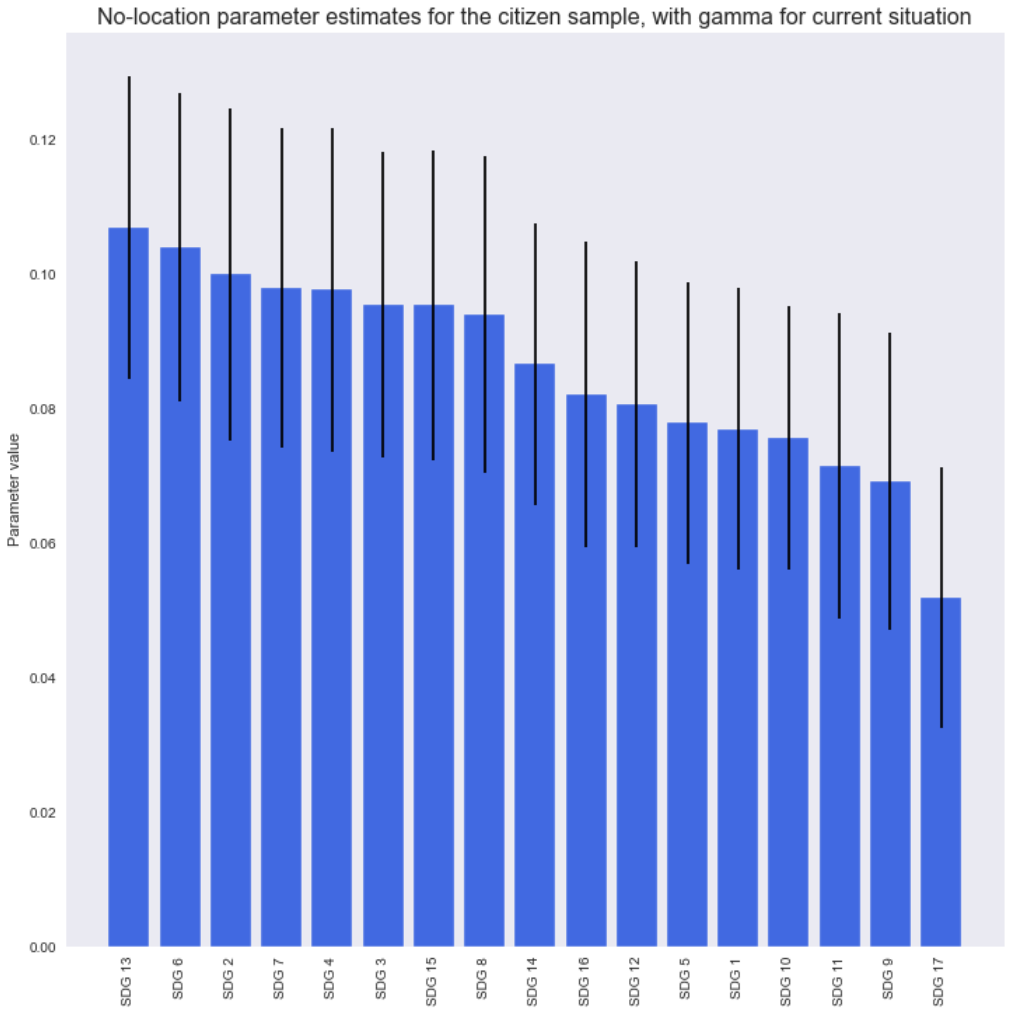


Figure D.10: Visualised parameter estimates of the citizen sample, without location effect

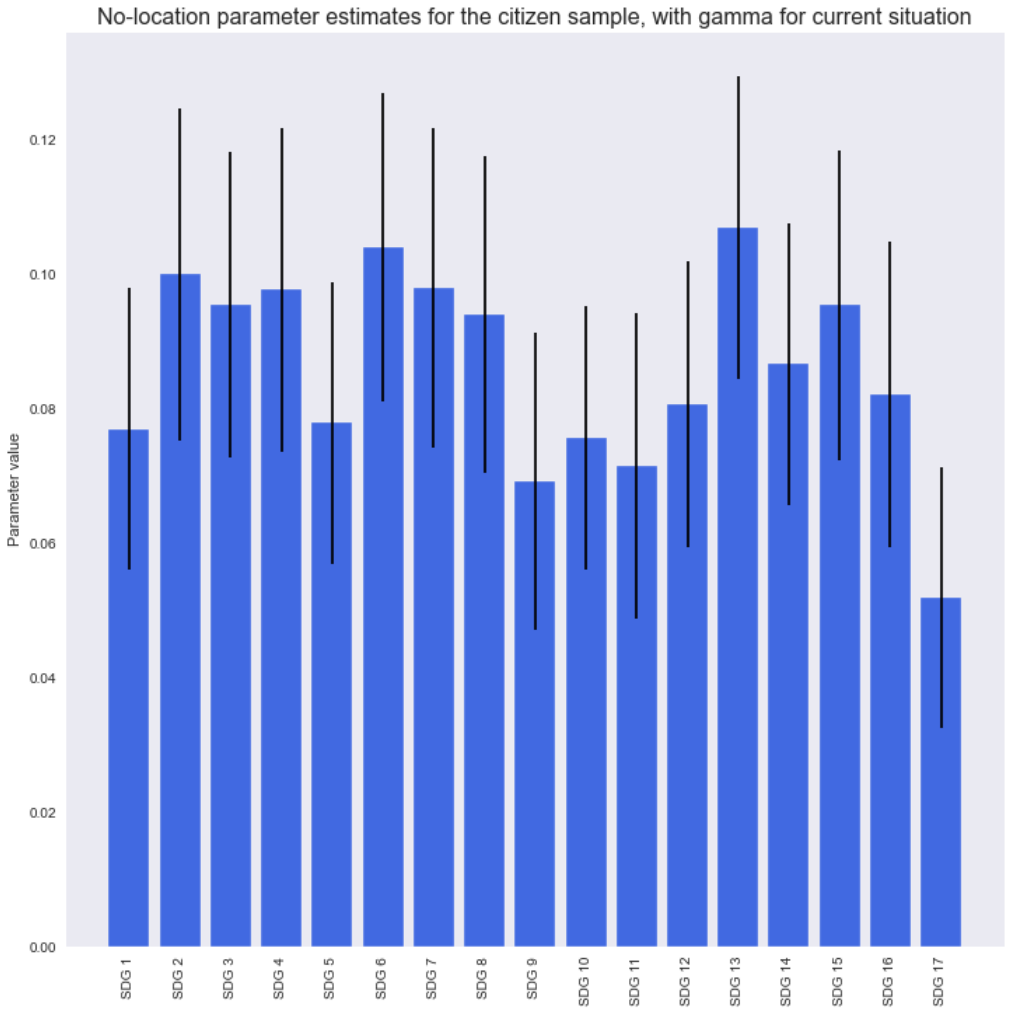


Figure D.11: Visualised parameter estimates of the citizen sample, without location effect

19. A full-SDG model split per location, with a current situation interaction effect

Table D.37: Model estimation summary of the citizen sample, with interaction effect current situation

Estimation variable	Value
Number of estimated parameters:	36
Sample size:	734
Excluded observations:	0
Init log likelihood:	-806.3814
Final log likelihood:	-674.1513
Likelihood ratio test for the init. model:	264.4602
Rho-square for the init. model:	0.164
Number of iterations:	90
Number of function evaluations:	201
Number of gradient evaluations:	56
Optimization time:	0:00:12.072416

Ben-Akiva & Swait test of model 18 (worse fit) and model 19 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 734 * ln(3) * \frac{(-681 - -674)}{-806}}\Big) = 9,11 * 10^{-5} \tag{D.7}$$

Table D.38: Parameter estimations of the citizen sample, with interaction effect current situation

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_GS_change	9.580e-02	1.490e-02	1.210e-10	6.660e-02	1.250e-01
B_SDG_10_NL_change	6.490e-02	1.120e-02	6.480e-09	4.295e-02	8.685e-02
B_SDG_11_GS_change	5.790e-02	1.520e-02	1.330e-04	2.811e-02	8.769e-02
B_SDG_11_NL_change	8.690e-02	1.500e-02	7.500e-09	5.750e-02	1.163e-01
B_SDG_12_GS_change	7.910e-02	1.300e-02	1.230e-09	5.362e-02	1.046e-01
B_SDG_12_NL_change	8.710e-02	1.500e-02	6.910e-09	5.770e-02	1.165e-01
B_SDG_13_GS_change	1.070e-01	1.410e-02	3.910e-14	7.936e-02	1.346e-01
B_SDG_13_NL_change	1.080e-01	1.510e-02	6.870e-13	7.840e-02	1.376e-01
B_SDG_14_GS_change	9.170e-02	1.300e-02	1.570e-12	6.622e-02	1.172e-01
B_SDG_14_NL_change	8.020e-02	1.470e-02	4.870e-08	5.139e-02	1.090e-01
B_SDG_15_GS_change	9.860e-02	1.460e-02	1.630e-11	6.998e-02	1.272e-01
B_SDG_15_NL_change	9.460e-02	1.600e-02	3.360e-09	6.324e-02	1.260e-01
B_SDG_16_GS_change	8.500e-02	1.570e-02	5.930e-08	5.423e-02	1.158e-01
B_SDG_16_NL_change	7.990e-02	1.410e-02	1.330e-08	5.226e-02	1.075e-01
B_SDG_17_GS_change	5.240e-02	1.370e-02	1.300e-04	2.555e-02	7.925e-02
B_SDG_17_NL_change	5.190e-02	1.220e-02	2.220e-05	2.799e-02	7.581e-02
B_SDG_1_GS_change	9.290e-02	1.530e-02	1.400e-09	6.291e-02	1.229e-01
B_SDG_1_NL_change	6.590e-02	1.270e-02	2.230e-07	4.101e-02	9.079e-02
B_SDG_2_GS_change	9.250e-02	1.650e-02	2.100e-08	6.016e-02	1.248e-01
B_SDG_2_NL_change	1.080e-01	1.630e-02	3.900e-11	7.605e-02	1.399e-01
B_SDG_3_GS_change	1.030e-01	1.470e-02	1.880e-12	7.419e-02	1.318e-01
B_SDG_3_NL_change	9.160e-02	1.590e-02	8.340e-09	6.044e-02	1.228e-01
B_SDG_4_GS_change	9.790e-02	1.790e-02	4.420e-08	6.282e-02	1.330e-01
B_SDG_4_NL_change	1.000e-01	1.470e-02	9.510e-12	7.119e-02	1.288e-01
B_SDG_5_GS_change	8.400e-02	1.340e-02	3.860e-10	5.774e-02	1.103e-01
B_SDG_5_NL_change	7.330e-02	1.410e-02	1.940e-07	4.566e-02	1.009e-01
B_SDG_6_GS_change	1.140e-01	1.440e-02	1.550e-15	8.578e-02	1.422e-01
B_SDG_6_NL_change	9.230e-02	1.610e-02	1.080e-08	6.074e-02	1.239e-01
B_SDG_7_GS_change	9.680e-02	1.520e-02	1.920e-10	6.701e-02	1.266e-01
B_SDG_7_NL_change	1.000e-01	1.640e-02	1.010e-09	6.786e-02	1.321e-01
B_SDG_8_GS_change	9.530e-02	1.490e-02	1.380e-10	6.610e-02	1.245e-01
B_SDG_8_NL_change	9.670e-02	1.600e-02	1.410e-09	6.534e-02	1.281e-01
B_SDG_9_GS_change	6.870e-02	1.380e-02	6.850e-07	4.165e-02	9.575e-02
B_SDG_9_NL_change	6.780e-02	1.520e-02	8.020e-06	3.801e-02	9.759e-02
B_current	-4.780e-04	1.000e-04	1.810e-06	-6.740e-04	-2.820e-04
B_tax	-1.050e-03	5.190e-04	4.260e-02	-2.067e-03	-3.276e-05

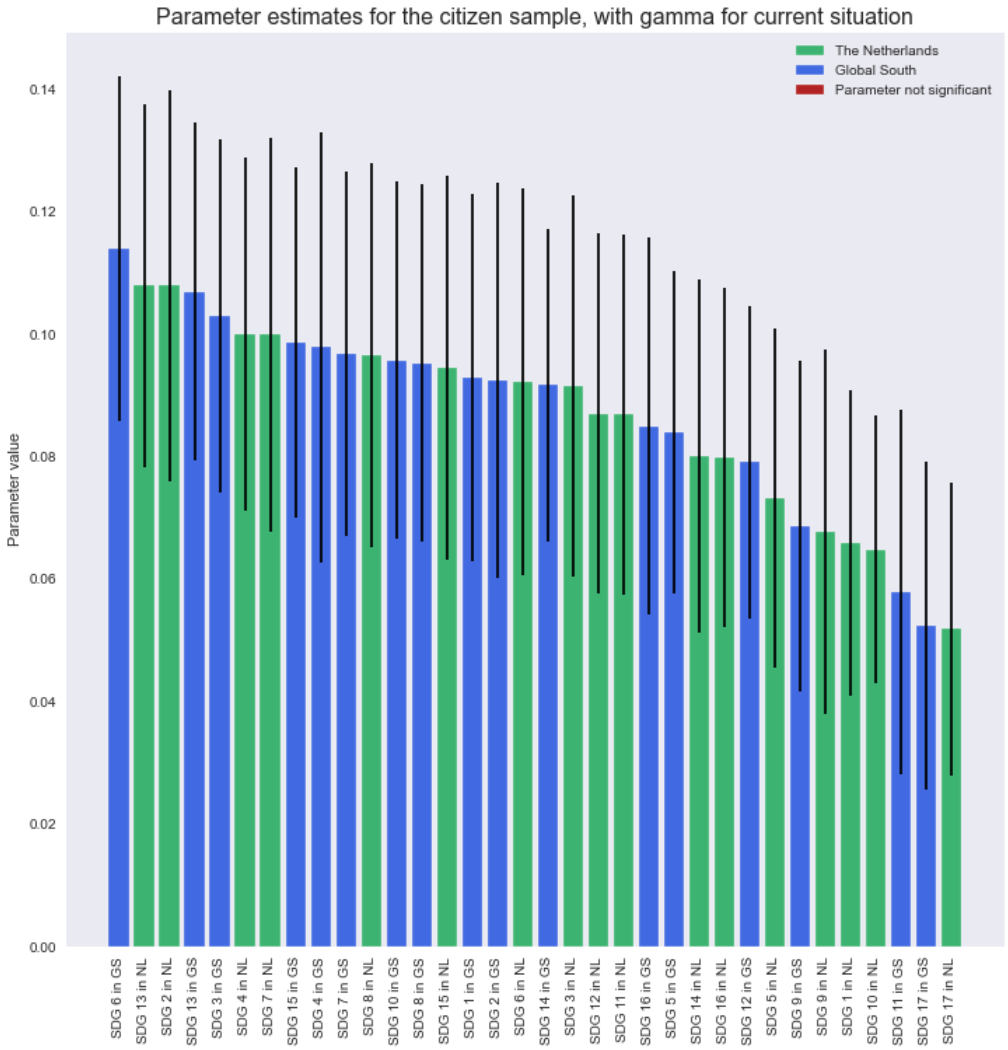


Figure D.12: Visualised parameter estimates of the citizen sample, with interaction effect current situation

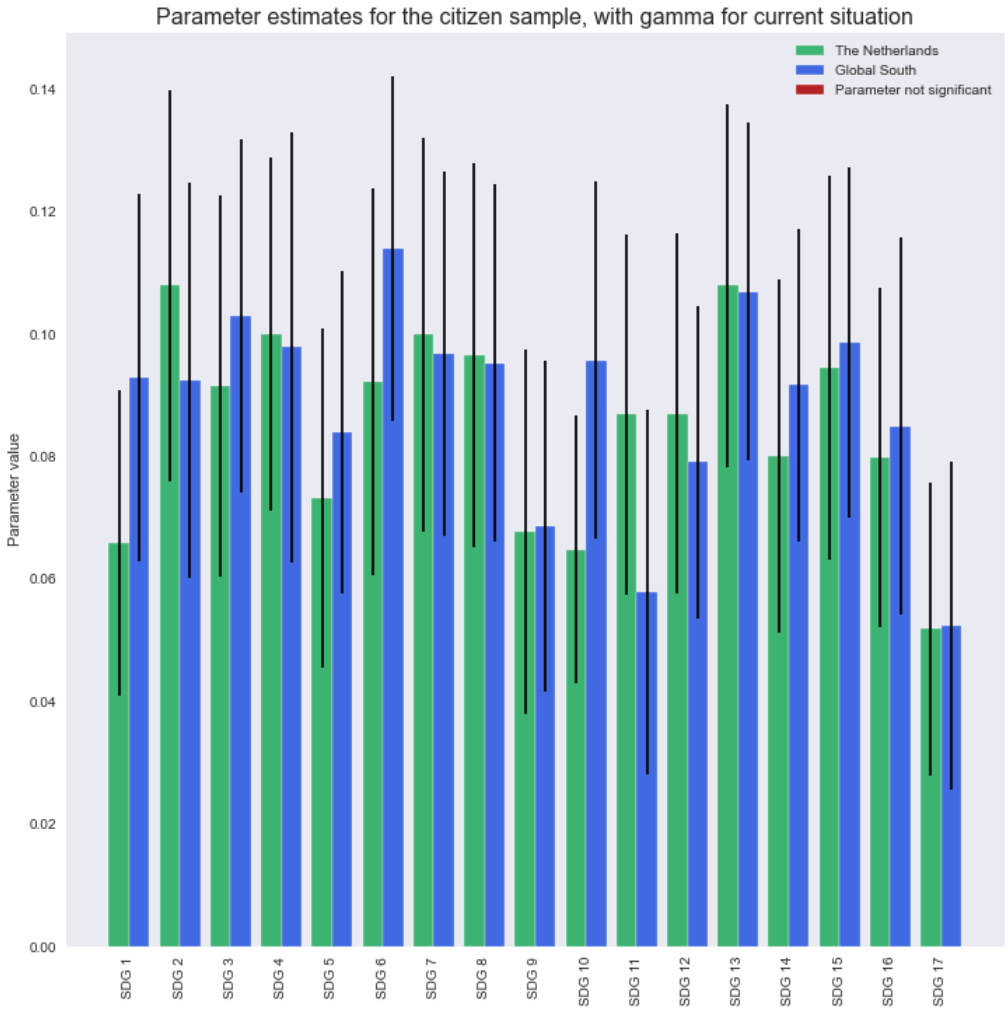


Figure D.13: Visualised parameter estimates of the citizen sample, with interaction effect current situation

20. A full-SDG model split per location and per SDG increase/decrease, with a current situation interaction effect

Table D.39: Model estimation summary of the citizen sample, with loss aversion effect

Estimation variable	Value
Number of estimated parameters:	70
Sample size:	734
Excluded observations:	0
Init log likelihood:	-806.3814
Final log likelihood:	-642.8542
Likelihood ratio test for the init. model:	327.0545
Rho-square for the init. model:	0.203
Number of iterations:	83
Number of function evaluations:	188
Number of gradient evaluations:	53
Optimization time:	0:00:25.230933

Ben-Akiva & Swait test of model 19 (worse fit) and model 20 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 734 * ln(3) * \frac{(-674 - -643)}{-806}}\Big) = 1,69 * 10^{-15} \tag{D.8}$$

Table D.40: Parameter estimations of the citizen sample, with loss aversion effect

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_GS_decrease	1.370e-01	4.120e-02	8.890e-04	5.625e-02	2.178e-01
B_SDG_10_GS_increase	6.780e-02	4.170e-02	1.040e-01	-1.393e-02	1.495e-01
B_SDG_10_NL_decrease	1.300e-01	3.380e-02	1.210e-04	6.375e-02	1.962e-01
B_SDG_10_NL_increase	4.230e-03	3.330e-02	8.990e-01	-6.104e-02	6.950e-02
B_SDG_11_GS_decrease	1.150e-01	4.300e-02	7.440e-03	3.072e-02	1.993e-01
B_SDG_11_GS_increase	8.560e-03	4.470e-02	8.480e-01	-7.905e-02	9.617e-02
B_SDG_11_NL_decrease	1.360e-01	4.190e-02	1.160e-03	5.388e-02	2.181e-01
B_SDG_11_NL_increase	4.400e-02	4.790e-02	3.580e-01	-4.988e-02	1.379e-01
B_SDG_12_GS_decrease	1.350e-01	4.340e-02	1.860e-03	4.994e-02	2.201e-01
B_SDG_12_GS_increase	3.360e-02	4.040e-02	4.050e-01	-4.558e-02	1.128e-01
B_SDG_12_NL_decrease	1.160e-01	4.770e-02	1.510e-02	2.251e-02	2.095e-01
B_SDG_12_NL_increase	6.650e-02	4.380e-02	1.290e-01	-1.935e-02	1.523e-01
B_SDG_13_GS_decrease	7.730e-02	4.200e-02	6.580e-02	-5.020e-03	1.596e-01
B_SDG_13_GS_increase	1.420e-01	4.090e-02	5.360e-04	6.184e-02	2.222e-01
B_SDG_13_NL_decrease	1.190e-01	4.180e-02	4.320e-03	3.707e-02	2.009e-01
B_SDG_13_NL_increase	1.050e-01	4.620e-02	2.290e-02	1.445e-02	1.956e-01
B_SDG_14_GS_decrease	1.360e-01	3.830e-02	3.800e-04	6.093e-02	2.111e-01
B_SDG_14_GS_increase	5.460e-02	3.730e-02	1.440e-01	-1.851e-02	1.277e-01
B_SDG_14_NL_decrease	1.770e-01	4.300e-02	3.900e-05	9.272e-02	2.613e-01
B_SDG_14_NL_increase	-1.160e-02	4.690e-02	8.050e-01	-1.035e-01	8.032e-02
B_SDG_15_GS_decrease	1.630e-01	4.370e-02	1.990e-04	7.735e-02	2.487e-01
B_SDG_15_GS_increase	4.290e-02	4.430e-02	3.330e-01	-4.393e-02	1.297e-01
B_SDG_15_NL_decrease	1.630e-01	5.290e-02	2.000e-03	5.932e-02	2.667e-01
B_SDG_15_NL_increase	2.920e-02	4.890e-02	5.510e-01	-6.664e-02	1.250e-01
B_SDG_16_GS_decrease	1.290e-01	4.360e-02	3.050e-03	4.354e-02	2.145e-01
B_SDG_16_GS_increase	4.570e-02	4.240e-02	2.820e-01	-3.740e-02	1.288e-01
B_SDG_16_NL_decrease	1.280e-01	4.040e-02	1.490e-03	4.882e-02	2.072e-01
B_SDG_16_NL_increase	3.430e-02	4.300e-02	4.250e-01	-4.998e-02	1.186e-01
B_SDG_17_GS_decrease	1.180e-01	4.600e-02	1.020e-02	2.784e-02	2.082e-01
B_SDG_17_GS_increase	-7.560e-03	4.590e-02	8.690e-01	-9.752e-02	8.240e-02
B_SDG_17_NL_decrease	2.480e-02	4.120e-02	5.480e-01	-5.595e-02	1.056e-01
B_SDG_17_NL_increase	8.540e-02	4.500e-02	5.770e-02	-2.800e-03	1.736e-01
B_SDG_1_GS_decrease	9.550e-02	4.100e-02	1.980e-02	1.514e-02	1.759e-01
B_SDG_1_GS_increase	9.330e-02	4.740e-02	4.920e-02	3.960e-04	1.862e-01
B_SDG_1_NL_decrease	2.200e-01	4.860e-02	6.020e-06	1.247e-01	3.153e-01
B_SDG_1_NL_increase	-7.720e-02	4.410e-02	7.970e-02	-1.636e-01	9.236e-03
B_SDG_2_GS_decrease	1.470e-01	5.440e-02	7.060e-03	4.038e-02	2.536e-01
B_SDG_2_GS_increase	4.500e-02	4.900e-02	3.580e-01	-5.104e-02	1.410e-01
B_SDG_2_NL_decrease	1.020e-01	4.730e-02	3.070e-02	9.292e-03	1.947e-01
B_SDG_2_NL_increase	1.310e-01	4.430e-02	3.210e-03	4.417e-02	2.178e-01
B_SDG_3_GS_decrease	1.110e-01	4.330e-02	1.050e-02	2.613e-02	1.959e-01
B_SDG_3_GS_increase	1.020e-01	4.760e-02	3.290e-02	8.704e-03	1.953e-01
B_SDG_3_NL_decrease	1.180e-01	4.470e-02	8.430e-03	3.039e-02	2.056e-01
B_SDG_3_NL_increase	7.220e-02	4.690e-02	1.230e-01	-1.972e-02	1.641e-01
B_SDG_4_GS_decrease	1.200e-01	5.020e-02	1.700e-02	2.161e-02	2.184e-01
B_SDG_4_GS_increase	8.820e-02	4.910e-02	7.230e-02	-8.036e-03	1.844e-01
B_SDG_4_NL_decrease	1.290e-01	4.400e-02	3.290e-03	4.276e-02	2.152e-01
B_SDG_4_NL_increase	8.030e-02	4.400e-02	6.830e-02	-5.940e-03	1.665e-01
B_SDG_5_GS_decrease	1.560e-01	3.880e-02	6.040e-05	7.995e-02	2.320e-01
B_SDG_5_GS_increase	1.810e-02	4.120e-02	6.600e-01	-6.265e-02	9.885e-02
B_SDG_5_NL_decrease	6.580e-02	4.020e-02	1.020e-01	-1.299e-02	1.446e-01
B_SDG_5_NL_increase	8.380e-02	4.020e-02	3.700e-02	5.008e-03	1.626e-01
B_SDG_6_GS_decrease	1.410e-01	4.370e-02	1.210e-03	5.535e-02	2.267e-01
B_SDG_6_GS_increase	9.770e-02	4.000e-02	1.470e-02	1.930e-02	1.761e-01
B_SDG_6_NL_decrease	1.440e-01	4.690e-02	2.200e-03	5.208e-02	2.359e-01
B_SDG_6_NL_increase	5.460e-02	4.780e-02	2.530e-01	-3.909e-02	1.483e-01
B_SDG_7_GS_decrease	6.110e-02	4.130e-02	1.390e-01	-1.985e-02	1.420e-01
B_SDG_7_GS_increase	1.360e-01	3.960e-02	6.190e-04	5.838e-02	2.136e-01
B_SDG_7_NL_decrease	2.240e-01	5.700e-02	8.490e-05	1.123e-01	3.357e-01
B_SDG_7_NL_increase	-9.140e-03	5.140e-02	8.590e-01	-1.099e-01	9.160e-02
B_SDG_8_GS_decrease	1.090e-01	4.100e-02	7.770e-03	2.864e-02	1.894e-01
B_SDG_8_GS_increase	8.090e-02	4.070e-02	4.680e-02	1.128e-03	1.607e-01
B_SDG_8_NL_decrease	8.810e-02	4.730e-02	6.220e-02	-4.608e-03	1.808e-01
B_SDG_8_NL_increase	1.140e-01	4.530e-02	1.230e-02	2.521e-02	2.028e-01
B_SDG_9_GS_decrease	1.600e-01	4.240e-02	1.640e-04	7.690e-02	2.431e-01
B_SDG_9_GS_increase	-2.120e-02	4.470e-02	6.350e-01	-1.088e-01	6.641e-02
B_SDG_9_NL_decrease	9.180e-02	4.490e-02	4.080e-02	3.796e-03	1.798e-01
B_SDG_9_NL_increase	4.590e-02	4.630e-02	3.220e-01	-4.485e-02	1.366e-01
B_current	-4.780e-04	1.060e-04	6.100e-06	-6.858e-04	-2.702e-04
B_tax	-1.260e-03	5.410e-04	1.990e-02	-2.320e-03	-1.996e-04

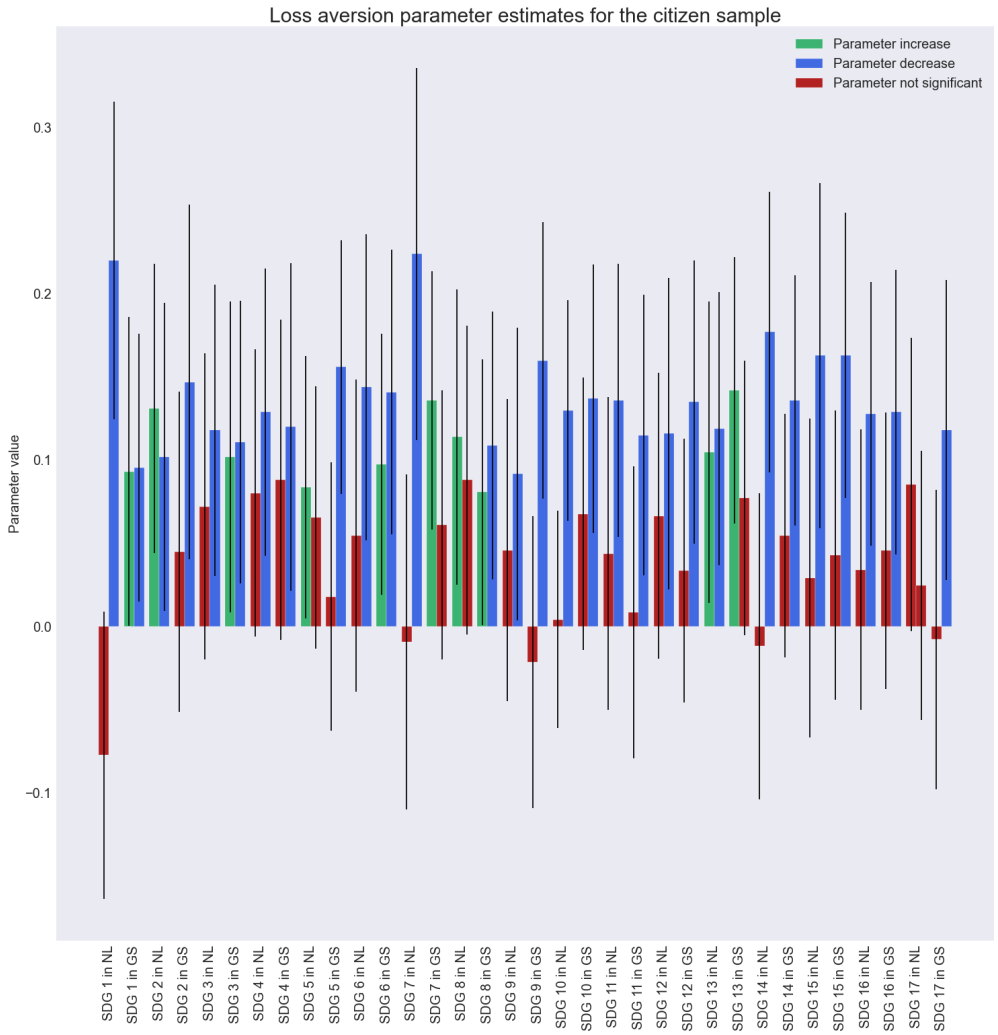


Figure D.14: Visualised parameter estimates of the citizen sample, with loss aversion effect

D.3 Policy maker sample models

The estimations in this section are performed for the sample of Dutch policy makers. In order of appearance, these are the following:

21. A model using the wedding cake theory, with a current situation interaction effect
22. A model using the 5Ps theory, with a current situation interaction effect
23. A full-SDG model, without distinguishing locations, with a current situation interaction effect

24. A full-SDG model split per location, with a current situation interaction effect
25. A full-SDG model split per location and per SDG increase/decrease, with a current situation interaction effect

21. A model using the wedding cake theory, with a current situation interaction effect

Table D.41: Model estimation summary of the policy maker sample, with wedding cake clustering

Estimation variable	Value
Number of estimated parameters:	10
Sample size:	325
Excluded observations:	0
Init log likelihood:	-357.049
Final log likelihood:	-304.6715
Likelihood ratio test for the init. model:	104.755
Rho-square for the init. model:	0.147
Number of iterations:	76
Number of function evaluations:	171
Number of gradient evaluations:	48
Optimization time:	0:00:03.643122

Table D.42: Parameter estimations of the policy maker sample, with wedding cake clustering

Parameter	Value	SE	p-value	LB	UB
B_biosphere_GS	8.670e-02	1.440e-02	1.900e-09	5.848e-02	1.149e-01
B_biosphere_NL	9.830e-02	1.500e-02	4.950e-11	6.890e-02	1.277e-01
B_current	-3.680e-04	1.360e-04	6.900e-03	-6.346e-04	-1.014e-04
B_economy_GS	7.930e-02	1.380e-02	8.820e-09	5.225e-02	1.063e-01
B_economy_NL	6.090e-02	1.300e-02	2.790e-06	3.542e-02	8.638e-02
B_partnership_GS	8.120e-02	1.900e-02	1.830e-05	4.396e-02	1.184e-01
B_partnership_NL	1.380e-02	2.180e-02	5.260e-01	-2.893e-02	5.653e-02
B_society_GS	9.070e-02	1.340e-02	1.390e-11	6.444e-02	1.170e-01
B_society_NL	7.520e-02	1.160e-02	1.020e-10	5.246e-02	9.794e-02
B_tax	-2.170e-03	7.650e-04	4.600e-03	-3.669e-03	-6.706e-04

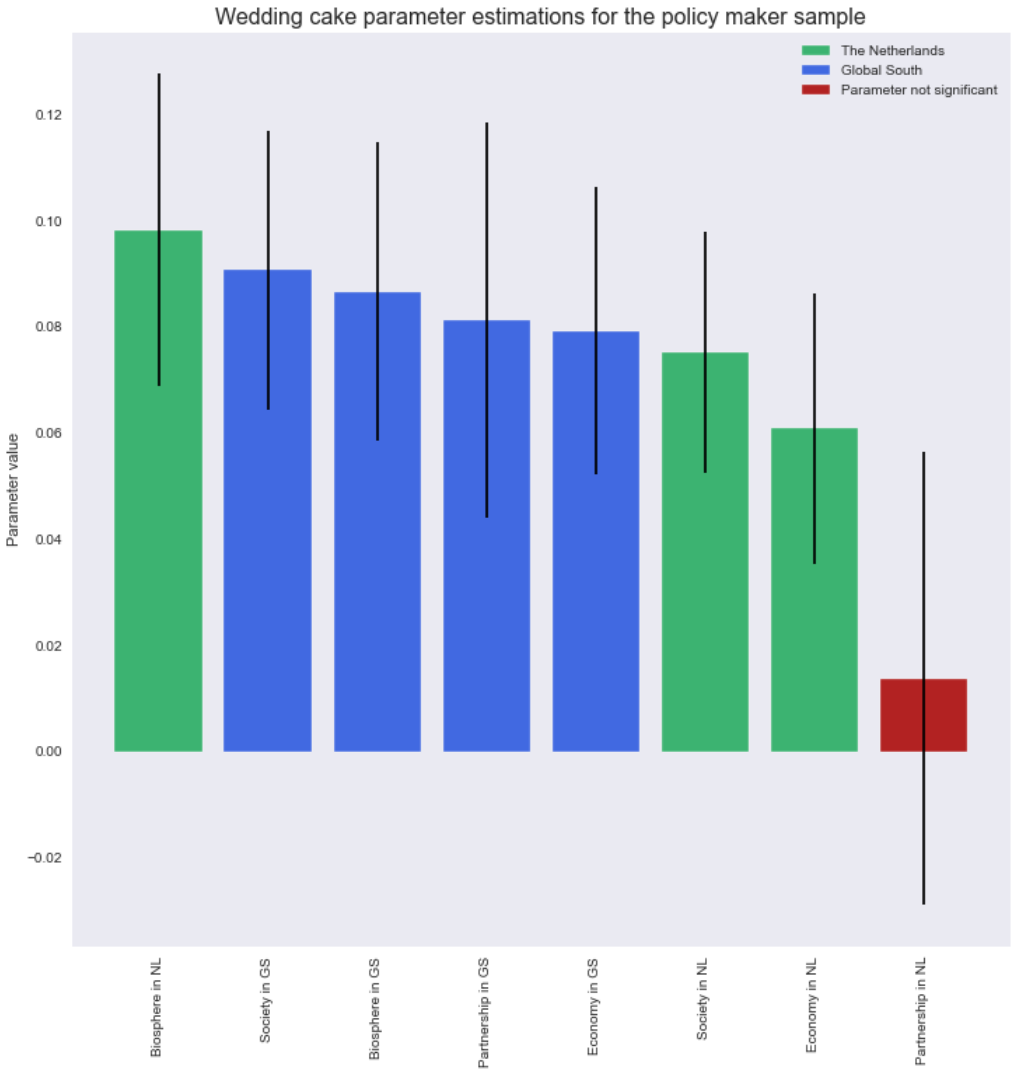


Figure D.15: Visualised parameter estimates of the policy maker sample, with wedding cake clustering

22. A model using the 5Ps theory, with a current situation interaction effect

Table D.43: Model estimation summary of the policy maker sample, with 5Ps clustering

Estimation variable	Value
Number of estimated parameters:	12
Sample size:	325
Excluded observations:	0
Init log likelihood:	-357.049
Final log likelihood:	-299.5745
Likelihood ratio test for the init. model:	114.949
Rho-square for the init. model:	0.161
Number of iterations:	82
Number of function evaluations:	189
Number of gradient evaluations:	54
Optimization time:	0:00:03.942477

Ben-Akiva & Swait test of model 21 (worse fit) and model 22 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 325 * ln(3) * \frac{(-305 - -300)}{-357}}\Big) = 7,82 * 10^{-4} \tag{D.9}$$

Table D.44: Parameter estimations of the policy maker sample, with 5Ps clustering

Parameter	Value	SE	p-value	LB	UB
B_current	-3.490e-04	1.380e-04	1.160e-02	-6.195e-04	-7.852e-05
B_partnership_GS	7.910e-02	1.910e-02	3.370e-05	4.166e-02	1.165e-01
B_partnership_NL	1.370e-02	2.200e-02	5.350e-01	-2.942e-02	5.682e-02
B_peace_GS	7.770e-02	2.610e-02	2.930e-03	2.654e-02	1.289e-01
B_peace_NL	1.150e-01	2.520e-02	4.900e-06	6.561e-02	1.644e-01
B_people_GS	9.690e-02	1.480e-02	5.140e-11	6.789e-02	1.259e-01
B_people_NL	7.730e-02	1.260e-02	8.080e-10	5.260e-02	1.020e-01
B_planet_GS	7.940e-02	1.360e-02	5.870e-09	5.274e-02	1.061e-01
B_planet_NL	9.900e-02	1.480e-02	2.210e-11	6.999e-02	1.280e-01
B_prosperity_GS	8.920e-02	1.400e-02	1.840e-10	6.176e-02	1.166e-01
B_prosperity_NL	5.300e-02	1.250e-02	2.350e-05	2.850e-02	7.750e-02
B_tax	-2.250e-03	7.760e-04	3.660e-03	-3.771e-03	-7.290e-04

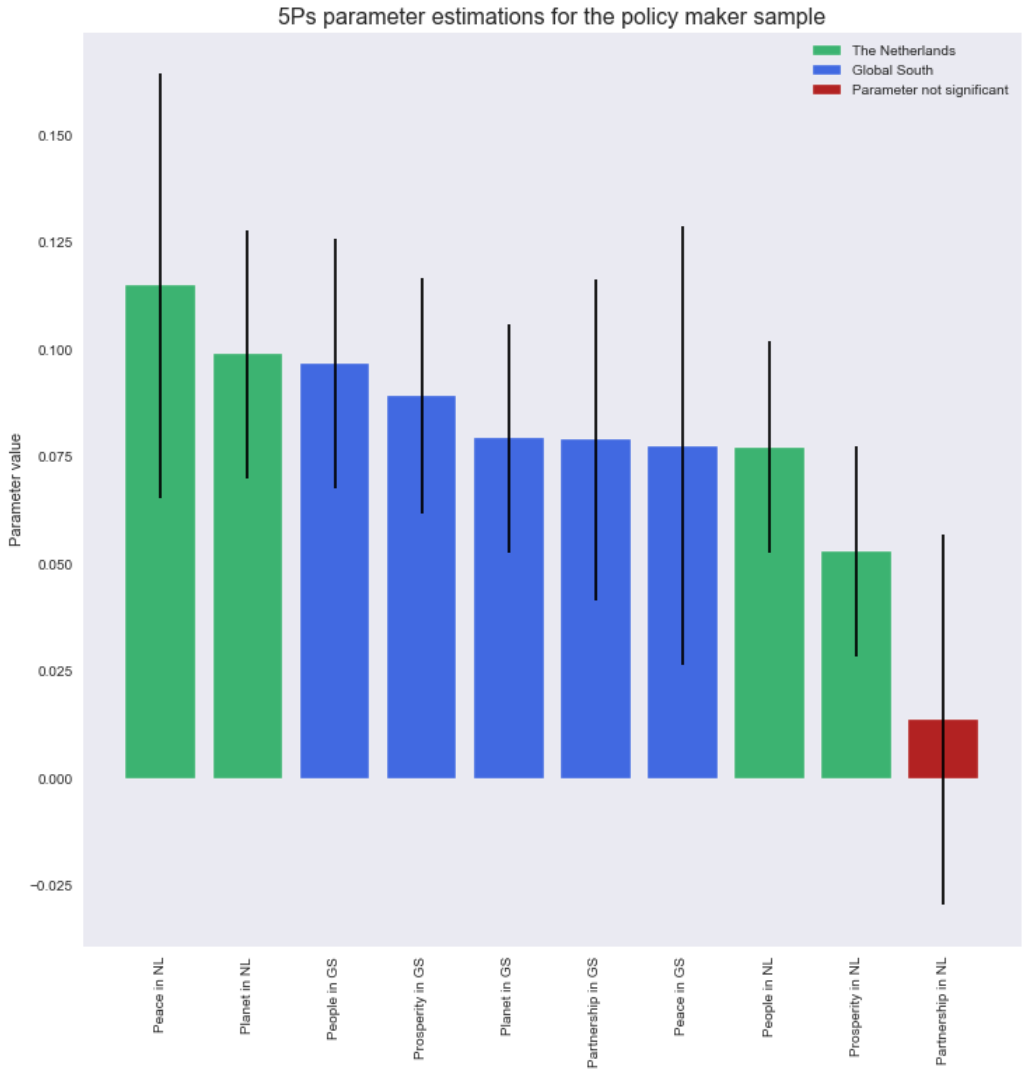


Figure D.16: Visualised parameter estimates of the policy maker sample, with 5Ps clustering

23. A full-SDG model, without distinguishing locations, with a current situation interaction effect

Table D.45: Model estimation summary of the policy maker sample, without location effect

Estimation variable	Value
Number of estimated parameters:	19
Sample size:	325
Excluded observations:	0
Init log likelihood:	-357.049
Final log likelihood:	-298.3719
Likelihood ratio test for the init. model:	117.3542
Rho-square for the init. model:	0.164
Number of iterations:	83
Number of function evaluations:	194
Number of gradient evaluations:	56
Optimization time:	0:00:04.147397

Ben-Akiva & Swait test of model 22 (worse fit) and model 23 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 325 * ln(3) * \frac{(-300 - -298)}{-357}}\Big) = 2,27 * 10^{-2} \tag{D.10}$$

Table D.46: Parameter estimations of the policy maker sample, without location effect

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_change	9.300e-02	1.750e-02	1.120e-07	5.870e-02	1.273e-01
B_SDG_11_change	6.690e-02	1.640e-02	4.510e-05	3.476e-02	9.904e-02
B_SDG_12_change	6.420e-02	1.640e-02	8.920e-05	3.206e-02	9.634e-02
B_SDG_13_change	1.050e-01	1.970e-02	8.350e-08	6.639e-02	1.436e-01
B_SDG_14_change	8.040e-02	1.580e-02	3.430e-07	4.943e-02	1.114e-01
B_SDG_15_change	1.210e-01	1.950e-02	5.490e-10	8.278e-02	1.592e-01
B_SDG_16_change	9.200e-02	1.870e-02	8.570e-07	5.535e-02	1.287e-01
B_SDG_17_change	5.300e-02	1.590e-02	8.640e-04	2.184e-02	8.416e-02
B_SDG_1_change	8.160e-02	1.750e-02	3.000e-06	4.730e-02	1.159e-01
B_SDG_2_change	9.090e-02	1.810e-02	5.210e-07	5.542e-02	1.264e-01
B_SDG_3_change	1.100e-01	1.780e-02	5.680e-10	7.511e-02	1.449e-01
B_SDG_4_change	8.070e-02	1.900e-02	2.220e-05	4.346e-02	1.179e-01
B_SDG_5_change	6.350e-02	1.580e-02	5.930e-05	3.253e-02	9.447e-02
B_SDG_6_change	7.240e-02	1.750e-02	3.670e-05	3.810e-02	1.067e-01
B_SDG_7_change	6.090e-02	1.790e-02	6.650e-04	2.582e-02	9.598e-02
B_SDG_8_change	7.080e-02	1.640e-02	1.620e-05	3.866e-02	1.029e-01
B_SDG_9_change	5.530e-02	1.450e-02	1.320e-04	2.688e-02	8.372e-02
B_current	-3.660e-04	1.460e-04	1.200e-02	-6.522e-04	-7.984e-05
B_tax	-2.150e-03	7.860e-04	6.240e-03	-3.691e-03	-6.094e-04

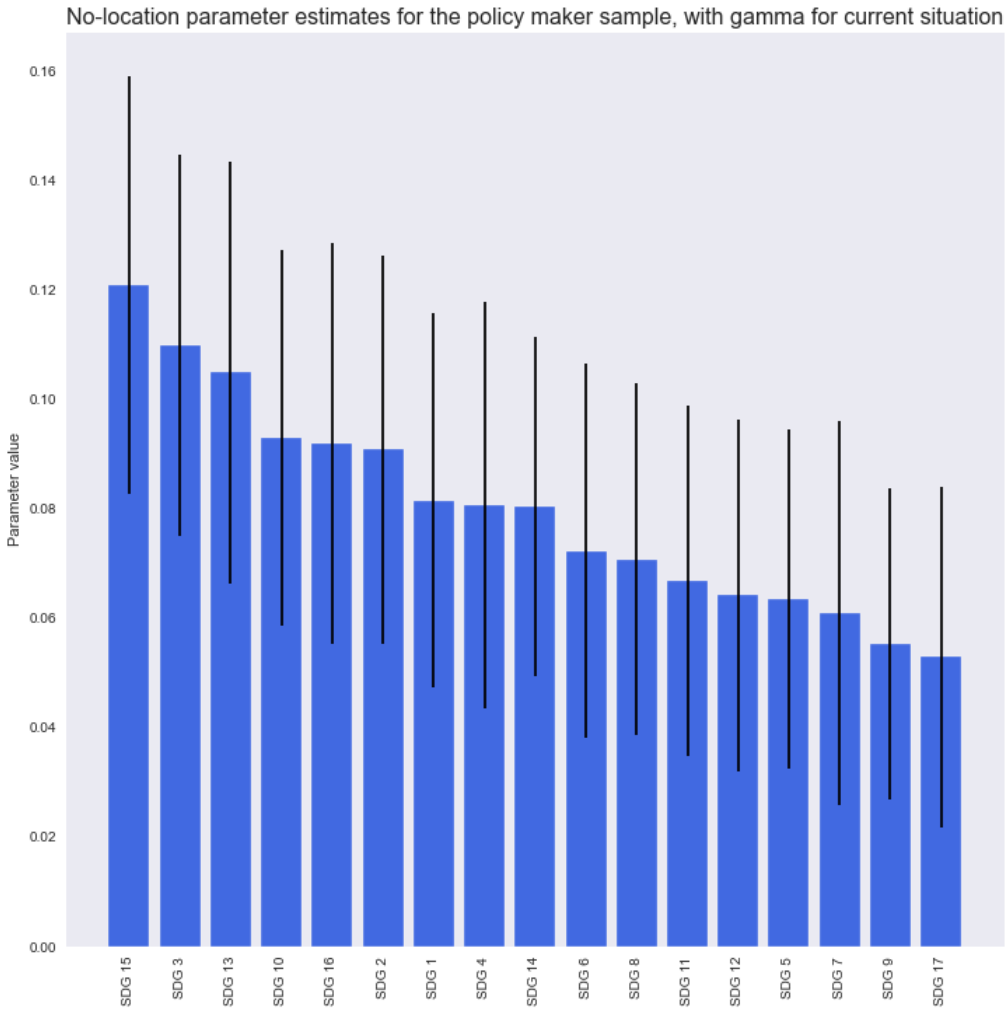


Figure D.17: Visualised parameter estimates of the policy maker sample, without location effect

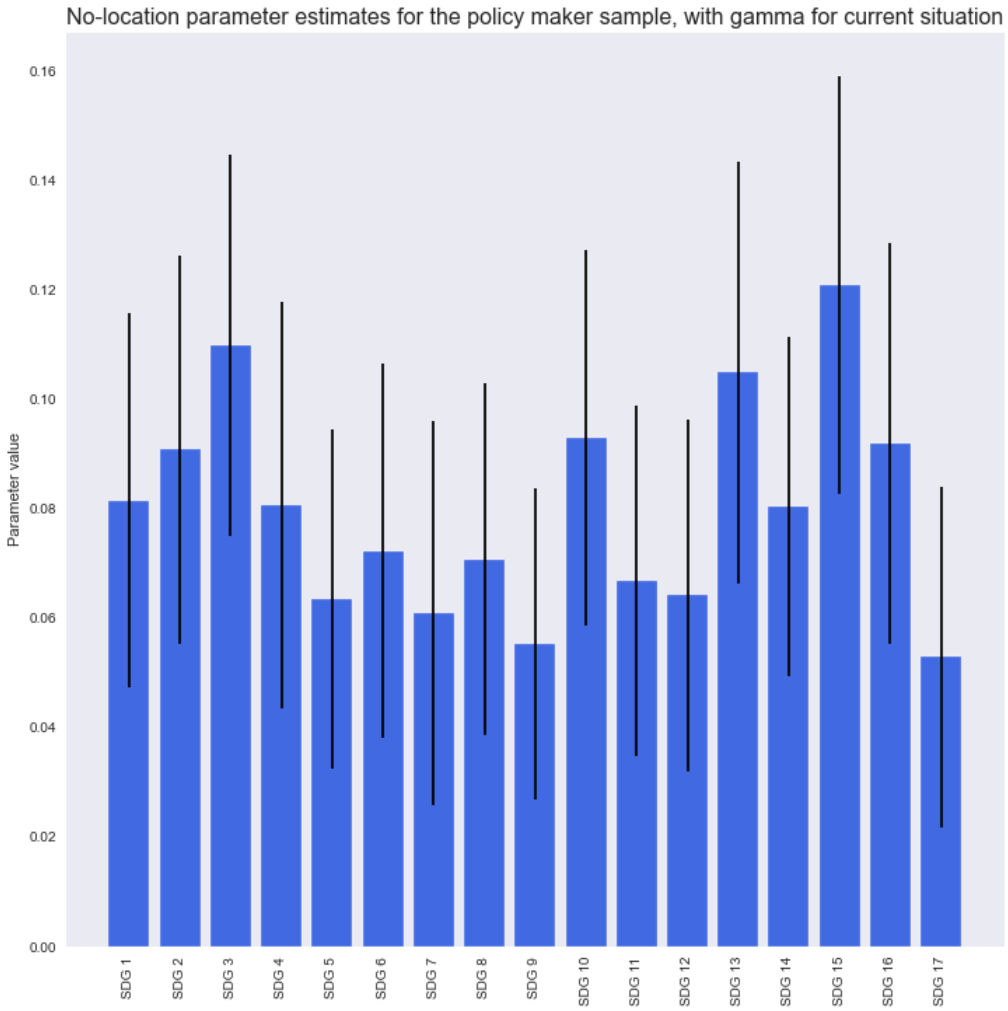


Figure D.18: Visualised parameter estimates of the policy maker sample, without location effect

24. A full-SDG model split per location, with a current situation interaction effect

Table D.47: Model estimation summary of the policy maker sample, with interaction effect current situation

Estimation variable	Value
Number of estimated parameters:	36
Sample size:	325
Excluded observations:	0
Init log likelihood:	-357.049
Final log likelihood:	-282.4272
Likelihood ratio test for the init. model:	149.2436
Rho-square for the init. model:	0.209
Number of iterations:	86
Number of function evaluations:	202
Number of gradient evaluations:	59
Optimization time:	0:00:06.031207

Ben-Akiva & Swait test of model 23 (worse fit) and model 24 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 325 * ln(3) * \frac{(-298 - -282)}{-357}}\Big) = 7,69 * 10^{-9} \tag{D.11}$$

Table D.48: Parameter estimations of the policy maker sample, with interaction effect current situation

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_GS_change	1.420e-01	3.140e-02	6.230e-06	8.046e-02	2.035e-01
B_SDG_10_NL_change	8.550e-02	2.090e-02	4.230e-05	4.454e-02	1.265e-01
B_SDG_11_GS_change	9.850e-02	2.540e-02	1.030e-04	4.872e-02	1.483e-01
B_SDG_11_NL_change	5.820e-02	2.130e-02	6.260e-03	1.645e-02	9.995e-02
B_SDG_12_GS_change	6.070e-02	2.110e-02	4.090e-03	1.934e-02	1.021e-01
B_SDG_12_NL_change	9.470e-02	2.420e-02	8.900e-05	4.727e-02	1.421e-01
B_SDG_13_GS_change	1.560e-01	3.840e-02	4.860e-05	8.074e-02	2.313e-01
B_SDG_13_NL_change	1.000e-01	2.340e-02	1.930e-05	5.414e-02	1.459e-01
B_SDG_14_GS_change	7.900e-02	1.930e-02	4.210e-05	4.117e-02	1.168e-01
B_SDG_14_NL_change	1.080e-01	2.430e-02	8.690e-06	6.037e-02	1.556e-01
B_SDG_15_GS_change	1.110e-01	2.900e-02	1.310e-04	5.416e-02	1.678e-01
B_SDG_15_NL_change	1.430e-01	2.480e-02	8.990e-09	9.439e-02	1.916e-01
B_SDG_16_GS_change	8.730e-02	2.730e-02	1.370e-03	3.379e-02	1.408e-01
B_SDG_16_NL_change	1.260e-01	2.680e-02	2.720e-06	7.347e-02	1.785e-01
B_SDG_17_GS_change	8.700e-02	2.010e-02	1.490e-05	4.760e-02	1.264e-01
B_SDG_17_NL_change	2.030e-02	2.270e-02	3.710e-01	-2.419e-02	6.479e-02
B_SDG_1_GS_change	1.030e-01	2.540e-02	4.830e-05	5.322e-02	1.528e-01
B_SDG_1_NL_change	8.330e-02	1.990e-02	2.940e-05	4.430e-02	1.223e-01
B_SDG_2_GS_change	1.220e-01	2.730e-02	8.700e-06	6.849e-02	1.755e-01
B_SDG_2_NL_change	7.920e-02	2.370e-02	8.500e-04	3.275e-02	1.257e-01
B_SDG_3_GS_change	1.210e-01	2.330e-02	1.840e-07	7.533e-02	1.667e-01
B_SDG_3_NL_change	1.190e-01	2.560e-02	3.610e-06	6.882e-02	1.692e-01
B_SDG_4_GS_change	1.060e-01	2.650e-02	6.140e-05	5.406e-02	1.579e-01
B_SDG_4_NL_change	7.270e-02	2.410e-02	2.540e-03	2.546e-02	1.199e-01
B_SDG_5_GS_change	8.700e-02	2.220e-02	8.680e-05	4.349e-02	1.305e-01
B_SDG_5_NL_change	6.400e-02	1.970e-02	1.150e-03	2.539e-02	1.026e-01
B_SDG_6_GS_change	8.380e-02	2.130e-02	8.440e-05	4.205e-02	1.255e-01
B_SDG_6_NL_change	6.560e-02	2.620e-02	1.220e-02	1.425e-02	1.170e-01
B_SDG_7_GS_change	8.590e-02	2.690e-02	1.370e-03	3.318e-02	1.386e-01
B_SDG_7_NL_change	4.590e-02	2.270e-02	4.360e-02	1.408e-03	9.039e-02
B_SDG_8_GS_change	9.290e-02	2.080e-02	8.380e-06	5.213e-02	1.337e-01
B_SDG_8_NL_change	5.260e-02	2.090e-02	1.160e-02	1.164e-02	9.356e-02
B_SDG_9_GS_change	7.920e-02	2.000e-02	7.740e-05	4.000e-02	1.184e-01
B_SDG_9_NL_change	4.830e-02	2.050e-02	1.830e-02	8.120e-03	8.848e-02
B_current	-4.290e-04	1.550e-04	5.720e-03	-7.328e-04	-1.252e-04
B_tax	-2.480e-03	8.220e-04	2.530e-03	-4.091e-03	-8.689e-04

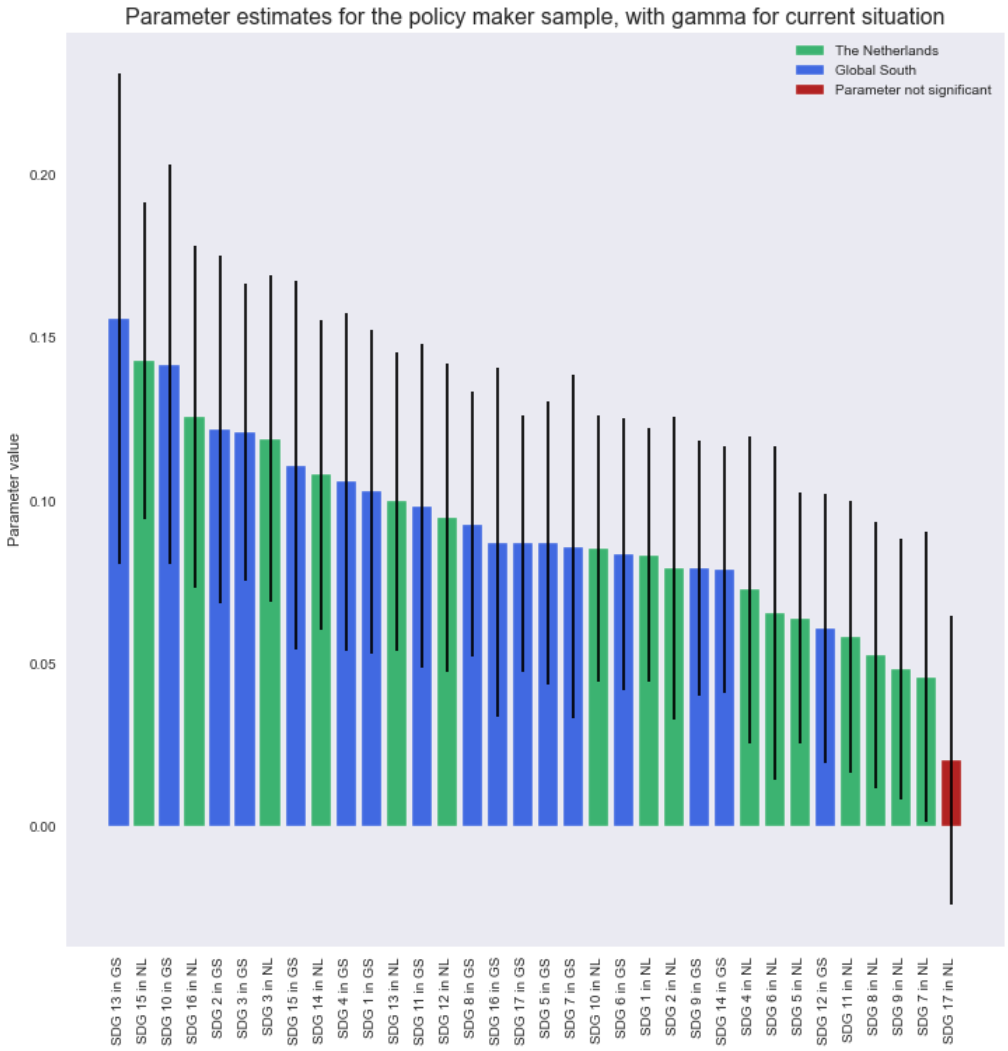


Figure D.19: Visualised parameter estimates of the policy maker sample, with interaction effect current situation

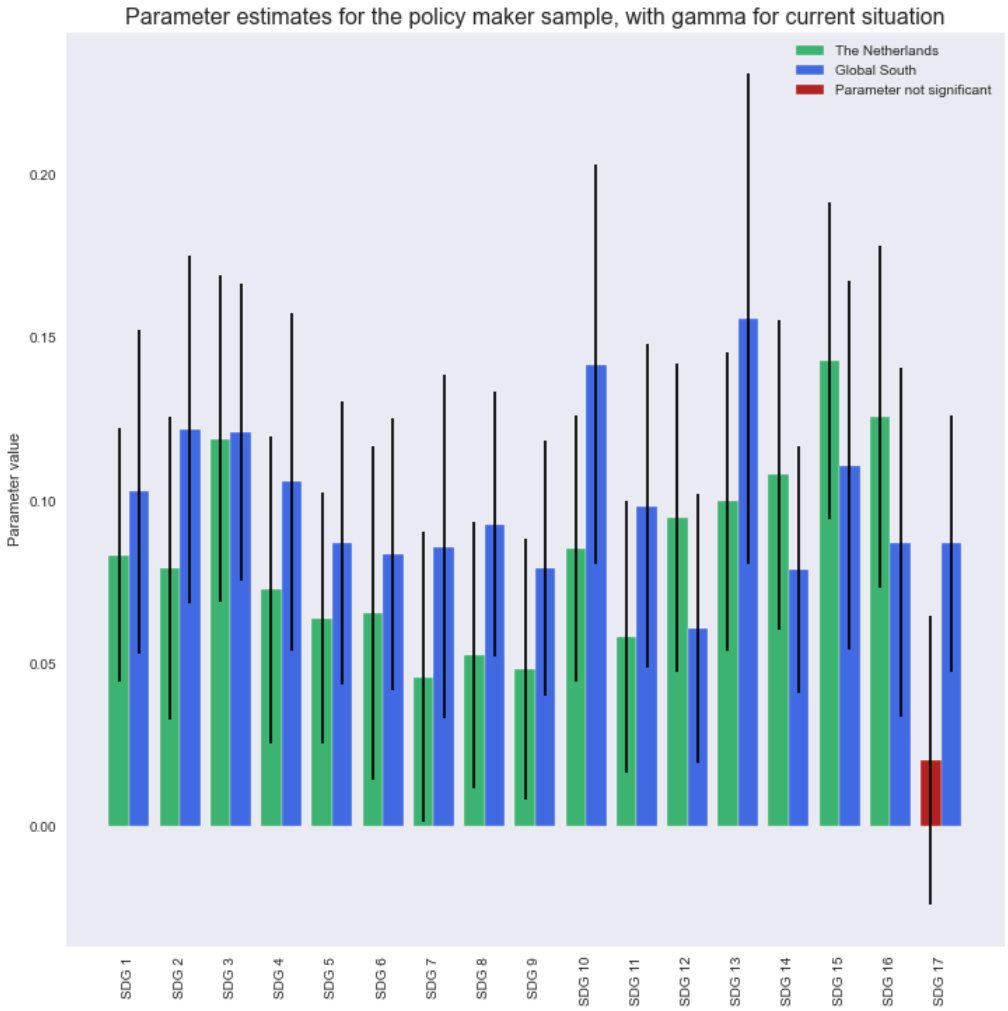


Figure D.20: Visualised parameter estimates of the policy maker sample, with interaction effect current situation

25. A full-SDG model split per location and per SDG increase/decrease, with a current situation interaction effect

Table D.49: Model estimation summary of the policy maker sample, with loss aversion effect

Estimation variable	Value
Number of estimated parameters:	70
Sample size:	325
Excluded observations:	0
Init log likelihood:	-357.049
Final log likelihood:	-244.1105
Likelihood ratio test for the init. model:	225.8769
Rho-square for the init. model:	0.316
Number of iterations:	92
Number of function evaluations:	217
Number of gradient evaluations:	63
Optimization time:	0:00:14.885613

Ben-Akiva & Swait test of model 24 (worse fit) and model 25 (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 325 * ln(3) * \frac{(-282 - -244)}{-357}}\Big) = 1,41 * 10^{-18} \tag{D.12}$$

Table D.50: Parameter estimations of the policy maker sample, with loss aversion effect

Parameter	Value	SE	p-value	LB	UB
B_SDG_10_GS_decrease	4.230e-01	1.390e-01	2.280e-03	1.506e-01	6.954e-01
B_SDG_10_GS_increase	-3.400e-02	8.440e-02	6.870e-01	-1.994e-01	1.314e-01
B_SDG_10_NL_decrease	9.540e-02	6.220e-02	1.250e-01	-2.651e-02	2.173e-01
B_SDG_10_NL_increase	9.550e-02	5.910e-02	1.060e-01	-2.034e-02	2.113e-01
B_SDG_11_GS_decrease	3.820e-02	7.190e-02	5.950e-01	-1.027e-01	1.791e-01
B_SDG_11_GS_increase	1.860e-01	7.090e-02	8.750e-03	4.704e-02	3.250e-01
B_SDG_11_NL_decrease	6.190e-02	6.080e-02	3.080e-01	-5.727e-02	1.811e-01
B_SDG_11_NL_increase	7.860e-02	7.670e-02	3.050e-01	-7.173e-02	2.289e-01
B_SDG_12_GS_decrease	6.310e-02	6.870e-02	3.590e-01	-7.155e-02	1.978e-01
B_SDG_12_GS_increase	7.800e-02	7.040e-02	2.680e-01	-5.998e-02	2.160e-01
B_SDG_12_NL_decrease	1.070e-01	7.750e-02	1.660e-01	-4.490e-02	2.589e-01
B_SDG_12_NL_increase	1.180e-01	9.120e-02	1.970e-01	-6.075e-02	2.968e-01
B_SDG_13_GS_decrease	7.990e-02	1.140e-01	4.840e-01	-1.435e-01	3.033e-01
B_SDG_13_GS_increase	2.140e-01	9.470e-02	2.410e-02	2.839e-02	3.996e-01
B_SDG_13_NL_decrease	1.400e-01	8.580e-02	1.030e-01	-2.817e-02	3.082e-01
B_SDG_13_NL_increase	9.660e-02	8.630e-02	2.630e-01	-7.255e-02	2.657e-01
B_SDG_14_GS_decrease	1.940e-01	5.860e-02	9.230e-04	7.914e-02	3.089e-01
B_SDG_14_GS_increase	-2.550e-03	5.790e-02	9.650e-01	-1.160e-01	1.109e-01
B_SDG_14_NL_decrease	1.300e-01	7.850e-02	9.760e-02	-2.386e-02	2.839e-01
B_SDG_14_NL_increase	1.110e-01	7.910e-02	1.590e-01	-4.404e-02	2.660e-01
B_SDG_15_GS_decrease	2.330e-01	9.090e-02	1.030e-02	5.484e-02	4.112e-01
B_SDG_15_GS_increase	2.030e-02	8.480e-02	8.110e-01	-1.459e-01	1.865e-01
B_SDG_15_NL_decrease	2.150e-01	6.570e-02	1.050e-03	8.623e-02	3.438e-01
B_SDG_15_NL_increase	9.920e-02	6.890e-02	1.500e-01	-3.584e-02	2.342e-01
B_SDG_16_GS_decrease	1.230e-01	7.700e-02	1.100e-01	-2.792e-02	2.739e-01
B_SDG_16_GS_increase	8.040e-02	9.410e-02	3.930e-01	-1.040e-01	2.648e-01
B_SDG_16_NL_decrease	2.720e-01	1.060e-01	1.010e-02	6.424e-02	4.798e-01
B_SDG_16_NL_increase	5.680e-02	7.290e-02	4.360e-01	-8.608e-02	1.997e-01
B_SDG_17_GS_decrease	1.420e-01	5.600e-02	1.120e-02	3.224e-02	2.518e-01
B_SDG_17_GS_increase	4.420e-02	5.640e-02	4.330e-01	-6.634e-02	1.547e-01
B_SDG_17_NL_decrease	-1.620e-02	7.030e-02	8.180e-01	-1.540e-01	1.216e-01
B_SDG_17_NL_increase	6.410e-02	7.280e-02	3.780e-01	-7.859e-02	2.068e-01
B_SDG_1_GS_decrease	2.530e-01	7.530e-02	8.000e-04	1.054e-01	4.006e-01
B_SDG_1_GS_increase	-1.580e-03	7.110e-02	9.820e-01	-1.409e-01	1.378e-01
B_SDG_1_NL_decrease	1.020e-01	5.950e-02	8.700e-02	-1.462e-02	2.186e-01
B_SDG_1_NL_increase	9.770e-02	5.800e-02	9.170e-02	-1.598e-02	2.114e-01
B_SDG_2_GS_decrease	2.830e-01	8.410e-02	7.690e-04	1.182e-01	4.478e-01
B_SDG_2_GS_increase	2.140e-02	6.610e-02	7.470e-01	-1.082e-01	1.510e-01
B_SDG_2_NL_decrease	1.540e-01	8.050e-02	5.620e-02	-3.780e-03	3.118e-01
B_SDG_2_NL_increase	3.580e-02	6.410e-02	5.760e-01	-8.984e-02	1.614e-01
B_SDG_3_GS_decrease	2.190e-01	7.180e-02	2.240e-03	7.827e-02	3.597e-01
B_SDG_3_GS_increase	4.020e-02	7.590e-02	5.960e-01	-1.086e-01	1.890e-01
B_SDG_3_NL_decrease	3.640e-01	1.130e-01	1.340e-03	1.425e-01	5.855e-01
B_SDG_3_NL_increase	-7.180e-02	8.570e-02	4.020e-01	-2.398e-01	9.617e-02
B_SDG_4_GS_decrease	3.160e-01	1.030e-01	2.060e-03	1.141e-01	5.179e-01
B_SDG_4_GS_increase	-5.100e-02	7.630e-02	5.040e-01	-2.005e-01	9.855e-02
B_SDG_4_NL_decrease	1.430e-01	8.430e-02	8.940e-02	-2.223e-02	3.082e-01
B_SDG_4_NL_increase	4.280e-02	8.100e-02	5.970e-01	-1.160e-01	2.016e-01
B_SDG_5_GS_decrease	2.500e-01	8.840e-02	4.690e-03	7.674e-02	4.233e-01
B_SDG_5_GS_increase	-5.480e-02	1.070e-01	6.090e-01	-2.645e-01	1.549e-01
B_SDG_5_NL_decrease	2.000e-01	6.560e-02	2.290e-03	7.142e-02	3.286e-01
B_SDG_5_NL_increase	-5.240e-02	6.830e-02	4.430e-01	-1.863e-01	8.147e-02
B_SDG_6_GS_decrease	1.470e-01	5.840e-02	1.180e-02	3.254e-02	2.615e-01
B_SDG_6_GS_increase	4.850e-02	5.310e-02	3.610e-01	-5.558e-02	1.526e-01
B_SDG_6_NL_decrease	2.670e-01	1.070e-01	1.270e-02	5.728e-02	4.767e-01
B_SDG_6_NL_increase	-7.200e-02	9.690e-02	4.570e-01	-2.619e-01	1.179e-01
B_SDG_7_GS_decrease	1.420e-01	7.370e-02	5.390e-02	-2.452e-03	2.865e-01
B_SDG_7_GS_increase	3.360e-02	7.420e-02	6.500e-01	-1.118e-01	1.790e-01
B_SDG_7_NL_decrease	1.090e-01	7.160e-02	1.280e-01	-3.134e-02	2.493e-01
B_SDG_7_NL_increase	-5.220e-03	8.210e-02	9.490e-01	-1.661e-01	1.557e-01
B_SDG_8_GS_decrease	3.380e-01	8.960e-02	1.600e-04	1.624e-01	5.136e-01
B_SDG_8_GS_increase	-1.110e-01	8.330e-02	1.810e-01	-2.743e-01	5.227e-02
B_SDG_8_NL_decrease	8.110e-02	5.600e-02	1.480e-01	-2.866e-02	1.909e-01
B_SDG_8_NL_increase	5.280e-02	6.410e-02	4.100e-01	-7.284e-02	1.784e-01
B_SDG_9_GS_decrease	1.760e-01	5.800e-02	2.330e-03	6.232e-02	2.897e-01
B_SDG_9_GS_increase	2.130e-03	5.640e-02	9.700e-01	-1.084e-01	1.127e-01
B_SDG_9_NL_decrease	1.390e-02	6.520e-02	8.320e-01	-1.139e-01	1.417e-01
B_SDG_9_NL_increase	9.720e-02	8.020e-02	2.260e-01	-5.999e-02	2.544e-01
B_current	-4.850e-04	1.8[illegible]e-04	6.890e-03	-8.378e-04	-1.322e-04
B_tax	-3.060e-03	9.310e-04	1.010e-03	-4.885e-03	-1.235e-03

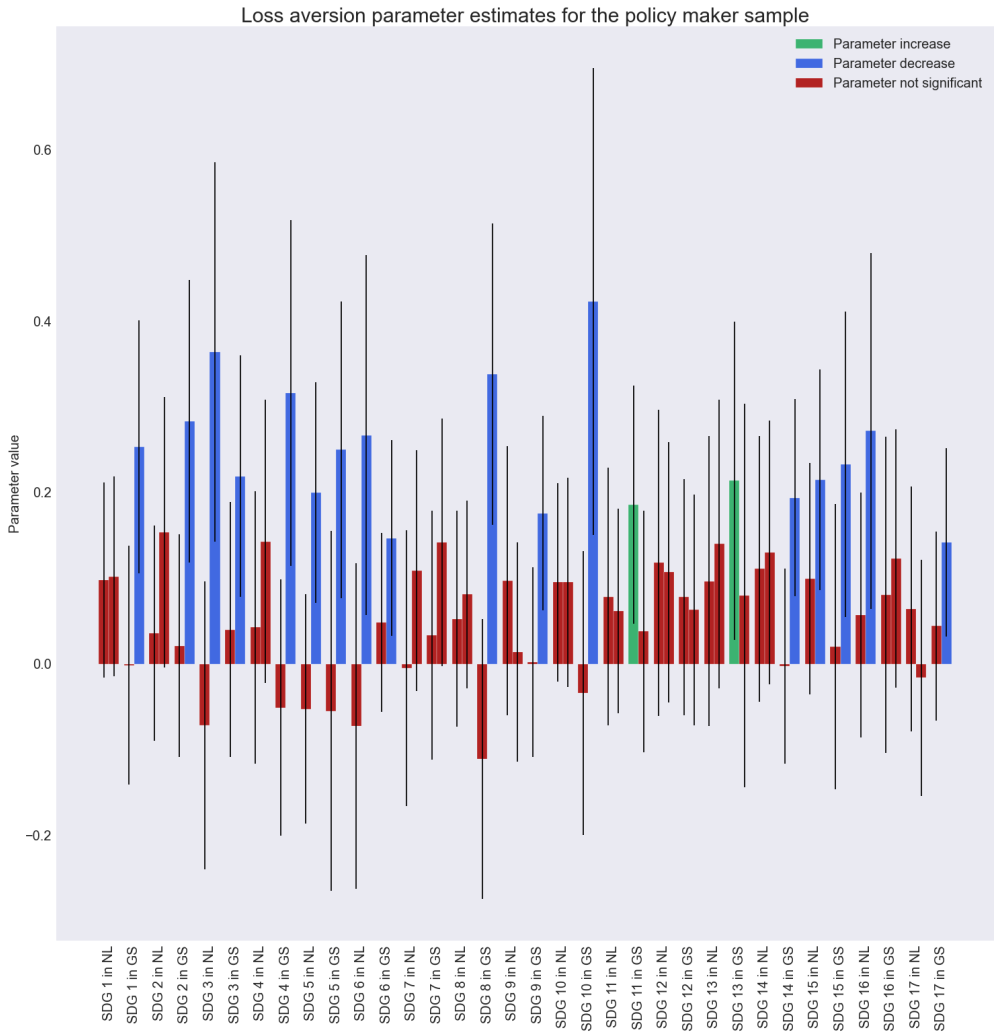


Figure D.21: Visualised parameter estimates of the policy maker sample, with loss aversion effect

D.4 Interaction effect models

The estimations in this section are performed with the goal of investigating possible effects of background variables. In order of appearance, these are the following:

1. A model for the total sample with an interaction effect for development aid optimism
2. A model for the total sample with an interaction effect for development aid conditionality
3. A model for the total sample with an interaction effect for the domestic-foreign trade-off
4. A model for the citizen sample with an interaction effect for gender

5. A model for the citizen sample with an interaction effect for age
6. A model for the citizen sample with an interaction effect for educational level
7. A model for the citizen sample with an interaction effect for political preference
8. A model for the citizen sample with an interaction effect for the level of SDG knowledge
9. A model for the policy maker sample with an interaction effect for SDG complexity
10. A model for the policy maker sample with an interaction effect for SDG feasibility
11. A model for the policy maker sample with an interaction effect for the influence of COVID-19

1. Model for the total sample with an interaction effect for development aid optimism

Table D.51: Model estimation summary of the total sample, with aid optimism interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-971.2294
Likelihood ratio test for the init. model:	384.402
Rho-square for the init. model:	0.165
Number of iterations:	142
Number of function evaluations:	367
Number of gradient evaluations:	113
Optimization time:	0:00:46.984893

Ben-Akiva & Swait test of the model with the interaction effect (worse fit) and the model without the interaction effect (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 1059 * ln(3) * \frac{(-979 - -971)}{-1163}}\Big) = 1,49 * 10^{-11} \tag{D.13}$$

2. Model for the total sample with an interaction effect for development aid conditionality

Table D.52: Model estimation summary of the total sample, with aid conditionality interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-979.363
Likelihood ratio test for the init. model:	368.1347
Rho-square for the init. model:	0.158
Number of iterations:	163
Number of function evaluations:	414
Number of gradient evaluations:	126
Optimization time:	0:00:51.855373

Ben-Akiva & Swait test of the model without the interaction effect (worse fit) and the model with the interaction effect (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 1059 * ln(3) * \frac{(-979 - -971)}{-1163}}\Big) = 1,49 * 10^{-11} \tag{D.14}$$

3. Model for the total sample with an interaction effect for the domestic-foreign trade-off

Table D.53: Model estimation summary of the total sample, with domestic-foreign trade-off interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	1059
Excluded observations:	0
Init log likelihood:	-1163.43
Final log likelihood:	-978.9521
Likelihood ratio test for the init. model:	368.9566
Rho-square for the init. model:	0.159
Number of iterations:	169
Number of function evaluations:	422
Number of gradient evaluations:	127
Optimization time:	0:00:58.549194

Ben-Akiva & Swait test of the model without the interaction effect (worse fit) and the model with the interaction effect (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 1059 * ln(3) * \frac{(-979 - -971)}{-1163}}\Big) = 1,49 * 10^{-11} \tag{D.15}$$

4. Model model for the citizen sample with an interaction effect for gender

Table D.54: Model estimation summary of the citizen sample, with gender interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	734
Excluded observations:	0
Init log likelihood:	-806.3814
Final log likelihood:	-674.0844
Likelihood ratio test for the init. model:	264.5941
Rho-square for the init. model:	0.164
Number of iterations:	105
Number of function evaluations:	254
Number of gradient evaluations:	75
Optimization time:	0:00:23.741440

Ben-Akiva & Swait test of the model with the interaction effect and the model without the interaction effect:

$$p = NormSDistr\Big(- \sqrt{2 * 737 * ln(3) * \frac{(-674 - -674)}{-806}}\Big) = 0,4 \tag{D.16}$$

5. Model model for the citizen sample with an interaction effect for age

Table D.55: Model estimation summary of the citizen sample, with age interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	734
Excluded observations:	0
Init log likelihood:	-806.3814
Final log likelihood:	-672.6267
Likelihood ratio test for the init. model:	267.5094
Rho-square for the init. model:	0.166
Number of iterations:	115
Number of function evaluations:	260
Number of gradient evaluations:	73
Optimization time:	0:00:25.237334

Ben-Akiva & Swait test of the model without the interaction effect (worse fit) and the model with the interaction effect (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 737 * ln(3) * \frac{(-674 - -672)}{-806}}\Big) = 0,054 \tag{D.17}$$

6. Model model for the citizen sample with an interaction effect for educational level

Table D.56: Model estimation summary of the citizen sample, with education interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	734
Excluded observations:	0
Init log likelihood:	-806.3814
Final log likelihood:	-673.4868
Likelihood ratio test for the init. model:	265.7893
Rho-square for the init. model:	0.165
Number of iterations:	213
Number of function evaluations:	550
Number of gradient evaluations:	169
Optimization time:	0:00:51.970676

Ben-Akiva & Swait test of the model with the interaction effect (worse fit) and the model without the interaction effect (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 737 * ln(3) * \frac{(-674 - -673)}{-806}}\Big) = 0,147 \tag{D.18}$$

7. Model model for the citizen sample with an interaction effect for political preference

Table D.57: Model estimation summary of the citizen sample, with political preference interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	734
Excluded observations:	0
Init log likelihood:	-806.3814
Final log likelihood:	-673.6009
Likelihood ratio test for the init. model:	265.5611
Rho-square for the init. model:	0.165
Number of iterations:	108
Number of function evaluations:	251
Number of gradient evaluations:	72
Optimization time:	0:00:25.599016

Ben-Akiva & Swait test of the model without the interaction effect (worse fit) and the model with the interaction effect (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 737 * ln(3) * \frac{(-674 - -673)}{-806}}\Big) = 0,147 \tag{D.19}$$

8. Model model for the citizen sample with an interaction effect for the level of SDG knowledge

Table D.58: Model estimation summary of the citizen sample, with SDG knowledge interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	734
Excluded observations:	0
Init log likelihood:	-806.3814
Final log likelihood:	-672.2141
Likelihood ratio test for the init. model:	268.3346
Rho-square for the init. model:	0.166
Number of iterations:	129
Number of function evaluations:	320
Number of gradient evaluations:	96
Optimization time:	0:00:33.100419

Ben-Akiva & Swait test of the model without the interaction effect (worse fit) and the model with the interaction effect (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 737 * ln(3) * \frac{(-674 - -672)}{-806}}\Big) = 0,054 \tag{D.20}$$

9. Model model for the policy maker sample with an interaction effect for SDG complexity

Table D.59: Model estimation summary of the policy maker sample, with SDG complexity interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	325
Excluded observations:	0
Init log likelihood:	-357.049
Final log likelihood:	-279.8346
Likelihood ratio test for the init. model:	154.4289
Rho-square for the init. model:	0.216
Number of iterations:	132
Number of function evaluations:	325
Number of gradient evaluations:	97
Optimization time:	0:00:18.544111

Ben-Akiva & Swait test of the model with the interaction effect (worse fit) and the model without the interaction effect (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 325 * ln(3) * \frac{(-282 - -279)}{-357}}\Big) = 0,106 \tag{D.21}$$

10. Model model for the policy maker sample with an interaction effect for SDG feasibility

Table D.60: Model estimation summary of the policy maker sample, with SDG feasibility interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	325
Excluded observations:	0
Init log likelihood:	-357.049
Final log likelihood:	-280.4294
Likelihood ratio test for the init. model:	153.2392
Rho-square for the init. model:	0.215
Number of iterations:	128
Number of function evaluations:	321
Number of gradient evaluations:	97
Optimization time:	0:00:18.394008

Ben-Akiva & Swait test of the model with the interaction effect (worse fit) and the model without the interaction effect (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 325 * ln(3) * \frac{(-282 - -280)}{-357}}\Big) = 0,164 \tag{D.22}$$

11. Model model for the policy maker sample with an interaction effect for the influence of COVID-19

Table D.61: Model estimation summary of the policy maker sample, with COVID-19 interaction effect

Estimation variable	Value
Number of estimated parameters:	37
Sample size:	325
Excluded observations:	0
Init log likelihood:	-357.049
Final log likelihood:	-279.7628
Likelihood ratio test for the init. model:	154.5724
Rho-square for the init. model:	0.216
Number of iterations:	165
Number of function evaluations:	416
Number of gradient evaluations:	126
Optimization time:	0:00:20.196994

Ben-Akiva & Swait test of the model with the interaction effect (worse fit) and the model without the interaction effect (better fit):

$$p = NormSDistr\Big(- \sqrt{2 * 325 * ln(3) * \frac{(-282 - -279)}{-357}}\Big) = 0,106 \tag{D.23}$$