

# **Revealing Dutch Developers' Willingness to Pay for Climate Adaptations through Theory of Planned Behaviour: a Contingent Valuation study**

Franka Noordam  
Master's Thesis in Spatial planning  
Planning, Land and Real Estate Development  
Nijmegen School of Management  
Radboud University  
February 2024

**Colophon**

Author: Franka Noordam

Student number: s1021351

Contact: frankanoordam@gmail.com

Institution: Radboud University Nijmegen

Faculty: Nijmegen School of Management

Program: Spatial Planning

Specialization: Planning, Land and Real Estate Development

Supervisor: Dr. D. A. A. Samsura

Word count: 20882

## Preface

In front of you lies my master thesis, 'Revealing Dutch Developers' Willingness to Pay for Climate Adaptations through Theory of Planned behaviour: a Contingent Valuation study'. The title is simply what this study entails. Almost a year of hard work has been put into this thesis, finalising my time as a student, after five and a half years of studying at Radboud. I wanted to do something with land value capturing, and my interest in climate change and land development put together this thesis. I would like to thank a few people for supporting me through the writing process, with the first person being my boyfriend Corné, always understanding of my work rhythm and being an amazing discussion partner. Furthermore, I would like to thank my friends and family for supporting me and sharing the same sentiment about writing a thesis. I would like to thank Lars and Willeke in particular for doing the final check on my thesis. I would also like to thank my colleagues at Stadkwadraat for allowing me to use their network for finding respondents. I do not think that without them, I would have had any respondents at all.

In addition, I would also like to thank Ira Irawati, for helping me understand the components behind Theory of Planned Behaviour and for much needed improvement and feedback on my questionnaire when I was getting started again on writing my thesis. Finally, I would like to thank my supervisor Ary Samsura, for giving great feedback and guidance throughout the writing process.

Readers, enjoy!

## Summary

With an increasing number of people residing in urban areas and a projected rise in the world's urban population of 68 percent in 2050 (United Nations, 2019), cities have been faced with a number of challenges concerning public health (Kuddus et al., 2020), climate change (Calvin et al., 2023) and quality of life (Allen, 2015). Especially climate change is a threat to our cities, bringing all-encompassing negative impacts on health, livelihoods, urban infrastructure, the economy, well-being of citizens and city services. Urban planning can be the solution to the negative consequences of climate change, by designing adaptation infrastructure. Long-term inclusive planning is needed to create an urban transition, offering benefits for mitigation, adaptation, human health and wellbeing, ecosystem services and vulnerability reduction (Calvin et al., 2023). Hence, climate change is an urgent topic cities should act on now, concerning the negative impacts it has on its citizens. This raises the question of who is going to finance these infrastructure projects. Here, land value capturing (LVC) comes in play, meaning capturing the value increase from land and real estate caused by public policies or activities, often demanding developers for contributions. Municipalities could use LVC to spread the financial load, since they struggle with covering costs for public amenities due to increased privatization and economic liberalization (Allen, 2015). LVC is already being used for investing in climate resilience for cities struggling with floods, sea level rise and extreme heat. (Dunning & Lord, 2020). With developers often having to make contributions to climate adaptation, the questions of whether they are willing to pay (WTP) rises. For this study, there will only be looked at developer agreements (*anterieure overeenkomst*), since the flexibility of the instrument (Muñoz Gielen & Lenferink, 2018). The study researches developers WTP through the Theory of Planned Behaviour (TPB). TPB exists out of behavioural components, predicting intention (Ajzen, 1985). The main research question is as follows:

*To what extent can developers' willingness to pay for climate adaptation be predicted through the components of behavioural intention in theory of planned behaviour?*

This question has been answered by surveying 89 developers through an online questionnaire. The data has been analysed through Structural Equation Modelling (SEM). The results have shown that the attitude and subjective norms developers have for contributing to climate adaptation significantly predicts the behavioural intention of WTP. This means that the attitude and social pressure felt by developers determines how much developers are willing to pay. What stood out was that perceived behavioural control did not have an influence on WTP. This is in contrast to previous literature (Van der Krabben, 2023; Hendricks et al., 2021) on the subject and the comments left by the respondents. The recommendation has been made to look further into attitudes and norms, and repeat the study with possible other measures for perceived behavioural control.

## Table of contents

Preface.....	2
Summary .....	3
1. Introduction .....	7
1.1 Contextual background.....	7
1.2 Problem statement .....	8
1.3 Research aim and research questions .....	9
1.4 Scientific and societal relevance .....	9
1.4.1 Scientific relevance .....	9
1.4.2 Societal relevance.....	11
2. Theoretical and conceptual framework .....	12
2.1 Land value capturing as a method for financing climate adaptation.....	12
2.1.1 The effect of public amenities on land value.....	13
2.1.2 Dutch land value capturing methods .....	14
2.1.3 Developers' willingness to pay .....	15
2.2 Willingness to Pay and Theory of Planned Behaviour.....	15
2.2.1 Contingent Valuation Method .....	17
2.2.2 Stated and revealed preference.....	17
2.3 Conceptual model.....	18
2.4 Operationalisation of the conceptual framework.....	18
2.4.1 Climate change adaptations .....	18
2.4.2 Willingness to pay .....	19
3. Methodology .....	22
3.1 Research strategy.....	22
3.1.1 Research philosophy.....	22
3.1.2 Research design and strategy.....	22
3.2 Research methods, data collection and analysis.....	23
3.2.1 Research methods.....	23
3.2.2 Questionnaire design and data collection .....	23
3.2.3 Data analysis.....	24
3.3 Validity and reliability.....	26
3.3.1 Validity.....	26
3.3.2 Reliability .....	26
4. Results .....	28
4.1 Descriptive statistics and assumptions .....	28
4.1.1 Summary of the variables.....	28
4.1.2 Normality.....	31

4.1.3	Linearity and homoscedasticity .....	31
4.1.4	Absence of multicollinearity .....	31
4.1.5	Internal consistency and reliability.....	32
4.2	Confirmatory factor analysis .....	33
4.3	Structural equation modelling .....	35
4.3.1	Control variables, transparency and equality .....	35
4.3.2	Estimates and modification indices .....	35
4.3.3	Assessing model fit.....	36
4.4	Interpretation and discussion of the results .....	36
5.	Conclusion.....	39
5.1	Answering the research questions .....	39
5.1.1	First sub-question .....	39
5.1.2	Second sub-question.....	39
5.1.3	Third sub-question.....	39
5.1.4	Fourth sub-question.....	40
5.1.5	Fifth sub-question.....	40
5.1.6	Main research question.....	41
5.2	Possible further development of theory based on the results of the study.....	41
5.3	Recommendations for praxis.....	42
5.4	Reflection on the limits of the study and on further research.....	42
	Literature .....	44
	Annex .....	52
	Appendix A: Operationalisation table ‘Willingness to pay’ .....	52
	Appendix B: Normality test .....	55
	Appendix C: Scatterplots.....	57
	1. Attitude.....	57
	2. Social norms .....	57
	3. Perceived behavioural control .....	58
	Appendix D: CFA .....	59
	1. Original model.....	59
	2. Best model.....	64
	Appendix E: SEM .....	68
	1. Control variables estimates.....	68
	2. Estimates before modification.....	69
	1. Modification indices.....	70
	2. Estimates after modification.....	71
	3. Model fit summary .....	72

Appendix F: Recoding of questions .....	75
Appendix G: Questionnaire (in Dutch) .....	76

### List of figures

Figure 1. Theory of Planned behaviour structural diagram (Ajzen, 1991).....	16
Figure 2. Conceptual model .....	18

### List of tables

Table 1. Descriptive statistics.....	29
Table 2. Age frequencies.....	29
Table 3. Years at work frequencies .....	30
Table 4. Sex frequencies .....	30
Table 5. Province frequencies .....	30
Table 6. WTP frequencies .....	31
Table 7. VIF-test.....	32
Table 8. Cronbach's Alpha attitude .....	32
Table 9. Cronbach's Alpha attitude per item .....	32
Table 10. Cronbach's Alpha control.....	32
Table 11. Cronbach's Alpha control per item.....	33
Table 12. Cronbach's Alpha norms .....	33
Table 13. Cronbach's Alpha norms per item .....	33
Table 14. Cronbach's alpha intention .....	33

# 1. Introduction

## 1.1 Contextual background

Cities today all around the globe are rapidly urbanizing. With 55 percent of the world population living in cities in 2018, it is expected that 68 per cent will live in cities by 2050. Europe was already 68 percent urbanized in 2018. With an increased share in economic activity and innovation, and higher quality public and private services, people are drawn to the opportunities a city brings (United Nations, 2019). However, while keeping up with the growth of their population, cities are faced with a number of challenges, such as health (Kuddus et al., 2020), climate change (Calvin et al., 2023) and quality of life (Allen, 2015). These challenges need to be combatted, and the prevalence of amenities can help with that. Amenities create social infrastructure, offering connections for people living in urban areas (Latham & Layton, 2019). Regarding climate change, cities are heavily affected by the multitude of consequences of the phenomenon. These consequences encompass negative impacts on health, livelihoods, urban infrastructure, the economy, well-being and services. Urban planning can help tackle these problems, by designing adaptation infrastructure in cities. Long-term inclusive planning is needed to create an urban transition, offering benefits for mitigation, adaptation, human health and wellbeing, ecosystem services and vulnerability reduction (Calvin et al., 2023). Hence, climate change is a topic cities should urgently address.

This brings up the question of who is going to pay for the mitigation and adaptation infrastructure for climate change. A tool that could be used by municipalities to spread the high financial load of adaptation infrastructure, is Land Value Capturing (LVC), which means capturing the value increase of land and real estate caused by public policies or activities. LVC is already being used for investing in climate resilience in cities struggling with floods, sea level rise and extreme heat. Scientific literature emphasizes the importance of more research looking into LVC as a useful tool for financing climate adaptation too (Dunning & Lord, 2020; Plastrik et al., 2019).

In The Netherlands public bodies are increasingly making use of LVC, since they are not able and/or not expected to finance public goods themselves. Another reason LVC is being used more is the increased privatization and economic liberalization of the past decade (Muñoz Gielen & Lenferink, 2018). LVC is a familiar concept for Dutch municipalities. In the 1990s and at the start of the 2000s, municipalities enacted a far more active land policy. This changed, however, with the 2007-2008 financial crisis in which municipalities lost a lot of money on investments, leading to them not being able to purchase and develop land themselves anymore. Due to this occurrence, Dutch municipalities have become risk averse and have been favouring less active land policies (Muñoz Gielen & Lenferink, 2018). However, not only active land policy counts as an LVC instrument, but there are more instruments available for Dutch public bodies. Some of these tax property owners, but others ask the developer to contribute. These are called developer obligations. There are two versions of developer obligations: the first one is regulated by law, the *exploitatieplan (EP)*, a non-negotiable developer obligation and the second one is the *anterieure overeenkomst (AO)*, a negotiable developer obligation and far more favoured and used by municipalities. The *anterieure overeenkomst* relies mostly on private law. The reason why the AO is used a lot more is due to the possibility of making developers cover more costs than in the EP (Muñoz Gielen & Lenferink, 2018). With this in mind, it can be concluded that in times of increased privatization and economic liberalization municipalities are no longer able to completely finance public amenities such as climate adaptation themselves, instead having to depend on developers to cover part of the costs of the public amenities needed to ensure a high quality of life for the residents of the newly created neighbourhood (Allen, 2015).

This raises the question if developers are willing to pay for climate adaptation in negotiable developer agreements (*AO*) and if there are ways to make it easier, more accessible and attractive for developers to cover costs. Studies have shown that amenities such as climate adaptation do not only improve the quality of life for citizens, but are also being reflected in property prices. For example, expanding

green spaces like parks could significantly contribute to a rise of property values (Mahmoudi et al., 2012). By calculating how amenities are being reflected in property prices, a better match between supply and demand can be created, revealing what people actually look for in a neighbourhood and a house (Visser et al., 2008). With this information, developers can invest with more certainty in cost-intensive amenities like climate adaptation, since such an investment raises property values (Kelly & Molina, 2023). This could raise the willingness of developers, even if they were not planning to invest in climate adaptation at first. Looking at what their current point of view is on this topic can give insight into whether or not enthrusting developers through similar information could help raise contributions for climate adaptation.

Another important reason for looking into developers' willingness to pay, is that municipalities are not getting the most out of developer obligations since they do not let developers fully cover all different kinds of costs, which are internal costs (*binnenplanse kosten*), costs for neighbourhood facilities (*bovenwijkse kosten*) and overhead costs (*bovenplanse kosten*) (De Leve et al., 2022). Exploring developers' willingness to pay could provide insight into the ways developers are currently covering costs for climate adaptation, and into their willingness to co-operate with municipalities on the issue. Moreover, it could open and inform this important debate on who should pay for what.

## 1.2 Problem statement

Looking into developers' willingness to pay has been done before, but not very frequently. An example of this is Oyewole et al. (2019), who showed that developers were more willing to invest in green features in the public space. Gensler and Urban Land Institute (2011) did a similar study by looking into how willing the private sector was to invest in open spaces. The conclusion was that they were more than willing to pay for open spaces, if the investments were managed properly and the right medium was made available. The studied group also wanted to pay more to be in close proximity to open spaces, which could lead to more capital being invested in open spaces. Developers showing their willingness to pay could possibly inspire municipalities into being more transparent about what developers are being charged for voluntary contributions to spatial developments, since the lack of transparency by the municipality means developers are not being treated equally, discouraging them from investing (Hendricks et al., 2021). A more recent study by Van der Krabben et al. (2023) examining the willingness to pay of developers for climate adaptation shows that developers are willing to pay for climate adaptation, but they see financial obstacles for investing. Issues with transparency and clarity of the municipal policies come across and the evidence for climate adaptation increasing property values is lacking. Furthermore, general concerns about the business case of the developer also play a part, since building costs have risen and additional building requirements are demanded over the past years. The theme of vague and untransparent policy is being reflected in that study, too.

Clearly, there is a problem in lack of information shared between developers and municipalities, preventing more efficient land value capturing and unjust contributions to climate adaptation. There is also an urgency to invest in climate adaptation, since it harms citizens and cities in different, problematic ways. This calls for research into the topic of how and how much contributions are being made by developers for climate adaptation. The behaviour of developers, which is the choice of whether or not to finance climate adaptation, should also be looked into. Researching the behavioural intention of developers can provide an important insight into the actual willingness to pay (WTP) for climate adaptation.

Often combined with WTP is Theory of Planned Behaviour (*TPB*). TPB has been used in studies to predict WTP and is an excellent way of uncovering the motives behind a behaviour. The theory holds that all actions are controlled by intentions (Ajzen, 1985). When combined with WTP, paying is seen as an action, and the willingness to pay as the intention (Ajzen & Driver, 1992). WTP and TPB have been used for studies concerning climate adaptation and environmental protection (Grilli & Notaro,

2019; López-Mosquera et al., 2014; López-Mosquera & Sánchez, 2012; Tan et al., 2023; Tao et al., 2011; Rekola & Mika, 2001; Fielding et al., 2008). These studies focus on the individual, who is often the user too, and their intention of paying for the previously mentioned topics. Research about the WTP of facilitators for climate adaptation and environmental protection is missing, especially research on developers. There specifically a shortage of research on the developers' perspective on WTP. Exceptions are Murakami (2018), Oyewole et al. (2019) and Van der Krabben et al. (2023), of which the last two studies focussed primarily on environmental protection. However, when looking at environmental protection as part of LVC, only Van der Krabben et al. (2023) incorporated this in their research. This means that there is a large research gap for this specific topic and for developers' WTP, which this study tries to fill by looking into developers' WTP for climate adaptation through TPB, in the context of LVC.

### 1.3 Research aim and research questions

The aim of this research is to gain more insight into the willingness to pay of developers for climate adaptation. It tries to understand the reasoning behind the preferences of developers to contribute to specific projects. Urban climate infrastructure needs to be financed, and often, the municipality will use LVC instruments as a way of financing this infrastructure. This concerns developers, since they are the ones asked to make contributions for climate adaptation. Examining developers' WTP for climate adaptation within developer agreements could enhance the transparency of financing mechanisms in the light of LVC. By looking into this, important insights will be given on developers' reasoning, thereby facilitating a clearer understanding of the process and motivations behind financing climate adaptation. This leads to the main research question of this study being:

'To what extent can developers' willingness to pay for climate adaptation be predicted through the components of behavioural intention in theory of planned behaviour?'

The sub-questions are:

1. To what extent do the developers intend to contribute to financing urban climate adaptation infrastructure developments?
2. How willing are the developers to contribute to financing urban climate adaptation infrastructure developments?
3. What are the developers' attitudes toward the decision to contribute to the financing of urban climate adaptation infrastructure developments?
4. Which parties could influence the developers' decision to contribute to financing urban climate adaptation infrastructure developments?
5. What is the perception of developers concerning the adversities, or lack there of, to contribute to financing urban climate adaptation infrastructure developments?

### 1.4 Scientific and societal relevance

#### 1.4.1 Scientific relevance

Prior to looking into developers' willingness to pay and climate adaptation, research about capturing public value and its relation to public amenities (such as climate adaptation) has been done, which can be seen as the foundation for this study. This can be seen in a study done by Dunning and Lord (2020), where it is suggested that there needs to be more research done on the politics of land value capturing (LVC) decision-making. This research can give an insight into this, by trying to make the decision-making process and the drives of developers more transparent. Dunning and Lord specifically mention that there should be research following up on LVC and climate change adaptation measures. Hence, this research will explore the topic of climate change adaptation measures in the context of LVC, which will be done by surveying developers about their behavioural intention to contribute to climate adaptation. The aim of this is to help fill the research gap that is present at the intersection of WTP, LVC and climate-change adaptations.

This is in line with the research agenda Van der Krabben et al. (2023) call for. They recommend further study of how land-based finance can act as leverage to additional public and private sector financing of climate adaptation measures, by increasing bankability (p. 55). This study makes an addition to the discourse surrounding LVC methods by providing insight on developers' WTP for the development of public infrastructure, especially related to climate adaptation, in the context of the implementation of LVC. It does this by looking at the WTP of developers for climate adaptation in developers' agreements, which counts as an LVC instrument, since it is land based financing of public goods. Giving possible explanations to what makes developers want to pay for climate adaptation can give an important insight for this research agenda and what themes should be looked into further. What makes this study especially helpful in contributing to the research agenda, is that it has a different approach to measuring developers WTP than Van der Krabben et al. (2023). By asking developers from all over The Netherlands, the focus does not lie on coastal cities but is nationwide, thus including inland cities. This is important, since a phenomenon such as urban heat island effect can occur in every city and is getting more extreme over the years due to climate change (Gunawardena et al., 2017). In this way, this study will add to the existing research by broadening the scope.

Following up on research on LVC and public amenities, Eakin et al. (2022) discuss in their study how researchers can work as a contributor to adaptation planning process by opening up dialogue among development interests, which could exist out of real estate developers and public authorities. This study aims to do so by revealing whether developers have a personal drive or an interest in contributing to climate adaptation, or if other factors necessitate greater consideration. With this insight, dialogue about the planning process among involved parties can be opened up.

Addressing the WTP for environmental protection and climate adaptation studied through TPB, it can be concluded that this topic has been researched thoroughly for individuals making use of this service (Grilli & Notaro, 2019; López-Mosquera et al., 2014; López-Mosquera & Sánchez, 2012; Tan et al., 2023; Tao et al., 2011; Rekola & Mika, 2001; Fielding et al., 2008). However, on the supplier side for environmental protection and adaptation, not much research has been done yet, and often only about WTP instead of TPB trying to predict WTP. Some studies do not just use developers, but instead look at the WTP for related land development institutions and stakeholders, on topics different from climate adaptation (Gensler and Urban Land Institute, 2011; Lu et al., 2015). Other studies do look at climate adaptation (Oyewole et al., 2019; Murakami, 2018, Van der Krabben et al., 2023) but they do not use TPB to predict WTP. This indicates that the subject has been scarcely researched, and further investigation is much needed.

Another reason why this study wants to enhance the existing literature on developers' WTP is that almost none of these studies have taken place in The Netherlands, which could give non-representative conclusions given the difference between countries and their institutional contexts. Plastrik et al. (2019) looked into how cities were paying for climate change adaptation, showing how much developers were covering for costs, but this was only researched in an American context. Gensler and Urban Land Institute (2011) did include Dutch respondents, however this study was not primarily focussed on developers. Other respondents were public sector entities, investors and almost half of the respondents were advisors. The study also suggested that more research should be done on developing open spaces to their full potential. Climate adaptation could be placed under this category, making public spaces heat and water resistant (Silva & Costa, 2018).

Furthermore, Lu et al. (2015) mention that research on willingness to pay can benefit from a larger sample size. A larger sample size provides that willingness to pay can be modelled against different variables, giving a quantitative insight into the subject. This study takes this recommendation and studies WTP quantitatively and models WTP together with TPB. In terms of study design, Oyewole et al. (2019) is the most similar considering it studies developers' WTP for green features quantitatively, however this study will differ by using a more advanced statistical method, since Oyewole et al. used a simple calculation to compare certain amenities and this study will use structural equation modelling.

They also did not base their study on TPB, in contrast to this study. In this way, this study can be a strong addition to the literature.

#### 1.4.2 Societal relevance

Since high amenity cities grow faster than low amenity cities, the future of cities depends on whether they are attractive places for consumers to live in and if the quality of life is high enough (Glaeser et al., 2001). This quality of life comes in danger with the dangerous implications of climate change. These implications mean a disastrous effect on health, livelihoods, urban infrastructure, the economy, well-being and services. Designing mitigation infrastructure in cities can reverse these effects, in combination with long-term inclusive planning (Calvin et al., 2023). Climate resilience is needed to keep urban areas safe from the impacts of climate change, especially in the Netherlands, since it is positioned almost (or completely, in the western part) at sea level in a large river delta (Stead, 2013). Investments are desperately needed for climate adaptation and mitigation infrastructure to keep cities liveable in the upcoming years. However, the costs of these investments need to be covered, and not just by municipalities and public bodies, since they often do not have the financial means for financing this. This is due to economic liberalization, meaning that developers are prominent market players in land markets and have a part to play when it comes to covering for certain costs, unlike municipalities with often a weak position in the development market (Muñoz Gielen & Lenferink, 2018). Value capturing can play an important role and help in paying for costs made for constructing public amenities and should be understood thoroughly (Shih & Shieh, 2020). Public amenities such as climate change resilience measures and infrastructure could be very well paid for by value capturing methods and are needed for making cities sustainable and durable for the future, however not a lot of cities are using LVC yet (Dunning & Lord, 2020).

In times when real estate developers have become key drivers of the production of space and are trying to make profits of the affordable housing market (Robin & Brill, 2018), using LVC as an instrument to finance public space seems a logical consequence. Dutch Municipalities make use of these LVC instruments, but not in the most efficient way (De Leve et al., 2022). Municipalities do not ask developers to cover for all the costs, where it is possible to do so. The question can be raised if municipalities fully understand LVC tools or how to apply them. To still make thriving, high quality and climate resilient cities, it is important that there is enough capital available to cover the costs of investing in public amenities. This study tries to seek out the relationship between developers and their willingness to pay for climate adaptation. The usefulness of doing so, is that by better understanding the WTP of developers, knowledge will be created on what drives developers to contribute and when not to. This information is crucial in how contributions to climate adaptation should be encouraged and what barriers to contribute can be taken away from developers. This can eventually speed up the process of climate adaptation being constructed in the cities, safeguarding citizens and making their environments more liveable.

Another problem that comes across in developer agreements and contributing is transparency. Transparency is a problem between municipalities and developers in agreements and policy (Gensler and Urban Land Institute, 2011; Hendricks et al., 2021). Municipalities are trying to better this by slowly moving towards a more communicative approach in planning procedures (Damurski, 2015). This study tries to investigate if developers are experiencing more control over their contributions for climate adaptation. It does so by assessing perceived behavioural control and giving respondents the opportunity to elaborate on their WTP and experiences in the process of contributing for climate adaptation. In reverse, by revealing what makes developers contribute, more transparency will be created on the developer side. Hopefully, this study will lead to an improvement of communication and transparency on the municipality's side and will reveal the actual intention of developers on whether or not they want to contribute to climate adaptation.

## 2. Theoretical and conceptual framework

In this chapter, the theoretical framework of this research will be discussed and a conceptual model will be presented. The state-of-the-art literature relevant for this study will be critically reflected on. The chapter ends with the operationalisation of the concepts used in this study.

Starting off with section 2.1, land value capturing as a way to finance climate adaptation will be explained. This is relevant for this research, because it will explain how LVC instruments can contribute to the availability and construction of public infrastructure. In section 2.1.1, the effect of public amenities on land value will be introduced, to strengthen the argument of why there should be invested in climate adaptation. This information will also be used in the questionnaire. In section 2.1.2, Dutch LVC methods will be explained, to give context to why this study focuses on developer obligations. In section 2.1.3, the current state of the literature on developers' WTP will be discussed to uncover if there are important factors that should be taken into account when researching WTP. In section 2.2, the theories used for this research will be explored and interpreted. This begins with explaining WTP and TPB and how they can be used together. Section 2.2.2 defines contingent valuation method (CVM) and how it fits within this study. Finally, in section 2.2.3, the difference between stated and revealed preference will be explained. The reason for this is that WTP can be split up into these categories, and it needs to be defined which one will be used in this study. In section 2.3, the conceptual model is shown. Following up, the relevant concepts for this study will be operationalised in section 2.4.

### 2.1 Land value capturing as a method for financing climate adaptation

The growth of cities in the upcoming years will demand a huge investment in infrastructure. This is to keep cities viable and have enough services for the people living in the urban areas. The expansion of population and economic growth will lead to increased land prices and property values. To finance the growth of the city, municipalities want to capture a part of the economic gains made. There are multiple instruments to do this. These instruments together are called Land Value Capturing (Peterson, 2009). Numerous studies have been done about how land value capturing can be used to finance public amenities. Since in this study public amenities will be used frequently as a term, it should be made clear that with the public amenities, climate adaptation is also seen as an amenity. Climate can have its own amenities, since people are willing to pay more to avoid excess heat or cold (Albouy et al., 2016). Climate change damage also has a negative impact on the amount of amenities, whereas adaptation can partially compensate for this (Bréchet et al., 2013).

Studies describe how effective LVC instruments can be in capturing gains made by developing projects. However, delving further into the process of LVC, it is argued that public bodies are ineffective in capturing revenue and various reasons are addressed to explain its cause. Real estate market conditions, municipalities' capacity to negotiate, approach to value capturing and investments risks for developers are the main arguments given in research (Tarakci & Turk, 2021; Eakin et al., 2022; Platrik et al., 2019; Mathur & Smith, 2019). LVC as an instrument itself also has its limitations. With negotiable developer obligations (NDO's) for example, contributions to on-site infrastructure are clear for developers, but when contributions for off-site infrastructure are requested, the link between the development and the contribution is not always clear. Moreover, another limitation of LVC is the misuse of public capabilities, which needs to be avoided. The financial aspects of planning could motivate municipalities in wrong ways and they can force unnecessary contractual conditions on developers. This is a pitfall for fair LVC and should be looked out for (Hendricks et al., 2021). Surprisingly, this opposes the notion that municipalities are ineffective in capturing the financial increment. What this shows, is that there is still discussion on whether or not LVC is an effective and just instrument. Another argument for this is that LVC methods and financial circumstances can vary a lot per country and city (Tarakci & Turk, 2021; Eakin et al., 2022; Platrik et al., 2019; Mathur & Smith, 2019). Using Spain as an example, land readjustment is regulated, which speeds up negotiating

processes between municipalities and developers, and creates lower land prices and development costs, leaving more room financially for developers to contribute to developments (Muñoz Gielen, 2012). It is thus hard to pinpoint one general conclusion about LVC for financing public amenities and researchers should be wary not to generalise their conclusions.

### 2.1.1 The effect of public amenities on land value

Besides developers being bound by legislation to contribute to certain public amenities (*bovenwijkse kosten/costs for neighbourhood facilities*) in The Netherlands and municipalities being able to recover costs from municipalities (Buitelaar et al., 2010), only 37 percent of municipalities let developers cover for some costs for neighbourhood facilities (De Leve et al., 2022). To ease the negotiation process between developers and public bodies for investments, developers should be aware of the profitability of investing in certain public amenities, and in this case, climate adaptation. To support this, multiple studies have been done on the topic of public amenities and their effect on real estate or land prices. A general consensus in literature is that public amenities have a positive effect on land and property value. One of the older studies on this is from Cheshire and Sheppard (1995). The researchers have published an extensive list of amenities that have a positive effect on land value. Other studies have researched a more specific set of amenities and its effect on property prices, such as green features and sports facilities (Feng & Humphreys, 2016; Escobedo et al., 2015; Kong et al., 2007; Hussain et al., 2021; Paniagua-Molina et al., 2021).

A problem that could occur while comparing these studies to the context of this research, is that no research has been conducted in the Netherlands, making it difficult to find relevant literature for the Dutch institutional context. Besides, the focus lies primarily on property prices, not land prices, which is also an important factor in increasing financial returns. To a lesser extent, land prices have been researched. Glumac et al. (2019) created an index for pricing urban land, Bao et al. (2014) concluded that land is priced through its characteristics and surrounding environment, del Saz-Salazaar and García-Menéndez (2005) said how distance to the highway, distance from the city business district and distance to the province's capital has an important impact on industrial land, and Aziz et al. (2020) also came to the conclusion that multiple factors such as neighbourhood services determine land value. It can thus be said that there are different kinds of variables influencing property and land prices and comparing studies should be done with caution, since research areas can differ a lot in neighbourhood conditions.

Concerning climate adaptation and property value, it is mostly accepted in the literature that adaptation has positive effect on property values for neighbouring houses. However, it is important to add that most studies done on this topic were using a hedonic model. This means that multiple assumptions have been made for this approach, which does not hold up for all types of adaptation. A relevant example for climate adaptation is how all buyers are aware of the characteristics of the house purchased, following the assumptions of a hedonic approach. Nonetheless, for some types of adaptation such as seawalls, buyers are more likely to be aware of the adaptation infrastructure in contrast to for example, knowledge of building codes. The buyers' awareness of the adaptations is important and should be assessed beforehand (Kiel, 2021). Another observation Kiel (2021) came across was that the impact of climate adaptation was very location specific, meaning that studies should be replicated at numerous locations. However, these types of studies are unlikely to be published, so it is important that these studies should be encouraged. A study that supports the message of climate adaptation having a positive impact on property values is Rohde & Lützkendorf (2009). They showed how investing in sustainable property development is highly profitable and is a major opportunity to increase financial returns for *property professionals*.

To look into how developers are actually contributing to climate adaptation, it is important to know which land value capturing methods are being utilized in The Netherlands.

### 2.1.2 Dutch land value capturing methods

To start off explaining land value capturing methods in The Netherlands, the difference between direct and indirect value capturing rationales should be set out. Direct instruments seek to capture the value increase under the rationale that this increase belongs to the community and not the homeowner. Often, these instruments are applied as taxes and can be charged at any time. Indirect value capture instruments differ in rationale from direct instruments and are often more pragmatic. The most common rationale is that developers and owners should internalize the costs of mitigating the impacts of their building plans. Indirect value capture instruments can be further divided into two different variants. The first variant taxes the landowner, the second one exists out of contributions made by developers and property owners, these contributions being called ‘developer obligations’.

Looking further into categorisation of instruments, developer obligations can be split out in non-negotiable obligations and negotiable obligations. Non-negotiable obligations (N-NDO’s) are legally binding and are written down in legislation. Negotiable developer obligations (NDO’s) on the other hand are not regulated as much as N-NDO’s and should be regulated by the municipality, which it often fails to (Muñoz Gielen & Lenferink, 2018).

Since the categorization between different value capture methods is clear, the following step is to look into Dutch value capture instruments. The first public law instrument is Profit tax, *Baatbelasting*, and is meant to be used by municipalities for directly charging landowners being served by local, new infrastructure. This instrument is almost not used as it is impractical and can only be used for a very small scope of changes in infrastructure (Sorel et al., 2014, p. 41). The second instrument is property tax in business investment zones, *Experimenten wet BI-zones*, which allows the increase of property taxes in specific areas. The revenues can, as a result, be used for public infrastructure. However, this instrument is not very often used. The third instrument is the developers contributions plan, *Exploitatieplan*, which is a public law instrument and a N-NDO. The municipality must approve the developers contributions plan with the change in land-use regulation. This policy specifically regulates what costs the municipality can recover from landowner, which is mostly local, site-specific, on-site public infrastructure (Muñoz Gielen & Lenferink, 2018). However, not a lot of municipalities are using the developers contributions plan because of the limited extent to which costs can be recovered (Buitelaar et al., 2012). This is where we get to the developer agreements, *anterieure overeenkomst*, as fourth value capture instrument. The developer agreements are NDO’s and thus a flexible instrument. It is known for being the most popular instrument for capturing value. This is due the framework for cost recovery being lightly regulated in the law, which leaves much room for interpretation and negotiation. Municipalities must implement policy that gives proper insight into the contributions needed to be made if they want to negotiate with developers, where far more costs can be recovered than in a developers contributions plan (Muñoz Gielen & Lenferink, 2018).

It should be stated that this policy is often standardized with fixed amounts and percentages for certain types of properties in municipal law. It is thus quite difficult to demonstrate the relationship between requested DO’s and a development, which leads to less transparency on the developers side of the negotiation. Besides transparency issues, there is also debate about the legitimacy and calculation for off-site infrastructure serving wider areas. “Voluntary” costs to spatial developments vary plenty across municipalities, bringing unequal treatment of developers and lack of transparency (Hendricks et al., 2021). Carrying out developer obligations and the request of contributions for public amenities therefore be done with great consideration and municipalities should strive for more transparency and equality between municipalities. Improvements while negotiating are not just necessary on the developer side of the contributions being made, but also on the municipality side. Since the type of instrument being used in value capturing greatly influences the value being captured, this study will use negotiable developer obligations (developer agreements) as the foundation of this research, since the flexibility of the instrument.

### 2.1.3 Developers' willingness to pay

One purpose of this study is to improve the transparency between municipality and developer by looking into how developers are willing to pay for climate adaptation. Looking into previous research on this topic can give more insight into what variables should be considered when researching willingness to pay. In this literature review, studies researching public amenities will be looked at too, since the scarcity of research on WTP for climate adaptation. For public amenities, there have not been many studies conducted on the WTP of developers for public amenities. Murakami (2018) identified developers' willingness to pay for accessible residential land being significant for within five hundred meter of a mass rapid transit station. It is unsure if the framework of the study can be copied to this research, since it studies state owned land sales and this study focusses on developer contributions. Another problem is that this study focuses on revealed preference instead of stated preference, where the latter is what will be researched in this study. The difference between stated and revealed preference will be explained in section 2.2.2. Lu et al. (2015) uncover how stakeholders are actually willing to pay more than currently is charged for construction waste disposal costs. Gensler and Urban Land Institute (2011) found out how the private sector was more than willing to pay for urban open spaces. A similarity that stands out between the two studies is that in both cases the willingness to pay was higher than expected or higher than currently is being paid. This similarity is something important to keep in mind while designing and analysing the survey for this research. Both studies did follow a different kind of research strategy. Lu et al. followed a framework using Contingent Value Method (CVM) for setting up their research, whereas Gensler and Urban Land Institute do not mention what kind of framework is followed doing their research. Therefore, the reader has to be cautious in interpreting the results, not knowing if the survey is designed properly. Oyewole et al. (2019) did similar research on developers' willingness to pay and specified this for green features. What they concluded was that developers were above average willing to invest in green features, especially if they were less cost intensive. However, the same question about the study being designed carefully occurs, since no research framework is followed, and results have only been analysed through frequency distributions and percentages. Nevertheless, Oyewole et al. do make clear what approach is used to analyse the data. Finally, the most relevant study for this research is Van der Krabben et al. (2023). It investigates developers WTP for climate adaptation, just as in this research. The study tries to fill the knowledge gap of developers' willingness to contribute to public infrastructure investments as climate adaptation. It tries to do so by a comparative case study of three coastal cities. The conclusions are that developers are a bit hesitant to contribute, since they are not sure what consequences these investments have for their businesscase and that public policy and requirements about climate adaptation are untransparent. Developers are not always aware about the urgency of making investments for climate adaptation too. However, they often do see the societal urgency in creating climate adaptation. The comparative case study is a different approach than used in this study, which could potentially lead to other results. Also, this study looks at WTP from a TPB standpoint, meaning that the actual intention will be researched instead of what developers claim to be the reason for them being hesitant to contribute.

## 2.2 Willingness to Pay and Theory of Planned Behaviour

A standard, economic view on willingness to pay is the maximum price a consumer is willing to pay for a given quantity of a product or service (Werthenbroch & Skiera, 2002). The concept of WTP is highly relevant for academics and managers and there are multiple indirect and direct methods to measure it (Schmidt & Bijmolt, 2019), going further than the economic view. WTP has been used very frequent in all different kinds of sciences, examples of this are health (Olsen & Smith, 2001; Dougall et al., 2020), climate (Nemet & Johnson, 2010), food (Katt & Meixner, 2020) and mobility (Li et al., 2010). WTP is a flexible and often reliable theory, however some problems are to be expected using the theory. When measuring hypothetical WTP opposing real WTP, a hypothetical bias of around 21% occurs. This could imply that studies researching hypothetical WTP, such as this study, should interpret the results downward. However, the study presenting these findings, only looked after private

goods, whereas climate adaptation is a public good (Schmidt & Bijmolt, 2019). Hypothetical bias for public goods has also been looked at by conducting a meta-analysis of 83 studies. A hypothetical value of 1,35 had been found, which is in contrary to popular belief, where it is expected that economic valuation is overstated by a factor of two or three. The hypothetical value means how much respondents will overestimate their own willingness to pay. However, the results of the study are highly positively skewed, which indicates that a few studies could be causing the overestimation, since the majority of observations do have a low calibration factor. Furthermore, a choice-based mechanism for surveying the respondents can reduce bias in WTP studies (Murphy et al., 2005). What this means for this study, is that results could be potentially a bit overestimated, however there is no strong evidence for this and the study uses a choice-based mechanism, which reduces bias. It is therefore not a big enough concern to not use WTP as a method.

Overall, it can be said that WTP is a flexible, reliable and well-researched theory, suiting this study. Although the WTP of developers has not been frequently researched as is revealed in 2.1.4, it has been for homebuyers and their WTP for (green) property (Van Ommeren & Van der Vlist, 2016; Zhang et al., 2016; Tan, 2011; Mandell & Wilhelmsson, 2011), public amenities (Johnson et al., 2012; Ajzen & Driver, 1992) and environmental protection (Grilli & Notaro, 2019; López-Mosquera et al., 2014; López-Mosquera & Sánchez, 2012; Tan et al., 2023; Tao et al., 2011; Rekola & Mika, 2001; Fielding et al., 2008). What can be translated back to this research, is how some of the studies use *Theory of Planned Behaviour* (TPB) to predict WTP. The framework of these studies could be copied to this study. To know if TPB is fitting for this research, the theory should be explained first.

The Theory of Planned Behaviour has been coined by Ajzen (1985). The theory holds that that all actions are controlled by intentions. TPB is an extension of Theory of Reasoned Action (TRA), which tries to predict volitional behaviour. TRA explains a persons' intention to perform an action by assessing the attitude toward the behaviour and the subjective norms. Attitude toward the behaviour is the individual's positive or negative evaluation of performing the behaviour. Subjective norm can be explained as the person's perception of the social pressure put on them to perform or not to perform the behaviour. However, the theory struggles with its predictive accuracy in situations where people have limited control over their actions. This is why TRA has been extended to TPB. TPB adds the component of perceived behavioural control, to account for these kinds of situations. Perceived behavioural control refers to the perceived ease or difficulty performing the behaviour. PBC also has a direct path to the behaviour being performed. There are two rationales for this, the first one being that the chances of performing the behaviour successfully increase when someone has increased PBC. The second rationale is that measuring actual control can often be substituted with PBC. How well PBC substitutes actual control depends on the accuracy of the perceptions (Ajzen, 1991). The complete framework for TPB can be seen in Figure 1. It can simply be interpreted as that the intention to perform a certain kind of behaviour can be predicted with the attitude toward the behaviour, subjective norms and perceived behavioural control and that behaviour can be directly influenced by perceived behavioural control.

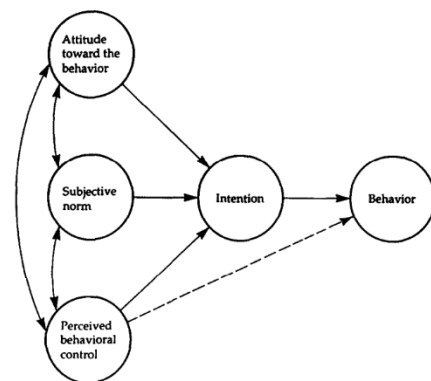


Figure 1. Theory of Planned behaviour structural diagram (Ajzen, 1991)

TRA can still be used in situations where there is purely volitional behaviour, but when success and control are subjective TPB can better be applied. Since contributing to climate adaptation is not volitional behaviour, TPB is more fitting for this study. The reason why contributing to climate adaptation is not volitional behaviour is that developers do not have complete control over their contributions being made, which is discussed in section 2.1.2.

TPB does face some critiques. Sniehotta (2009) claims that TPB is not an ideal theory for predicting behaviour, since it cannot account for changes in cognitions. They doubt the leading role of TPB in social sciences and advocate for a new research agenda developing theories on behaviour, with more rigorous testing and designs. However, in more recent literature, Alhamad and Donyai (2021) uphold that TPB is still the best theory to measure behaviour, comparing multiple other theories on behaviour. Another critique was made by Sussman and Gifford (2018). They challenged the assumption that attitudes, norms and control predict behavioural intention. What they found was that formed intentions could affect norms and attitudes in a reverse causal relationship. This questions the establishment of TPB as a causal theory. While Sussman and Gifford bring up an important new insight into the predictive quality of TPB, more research is still needed to subvert the standard TPB model, observing that TPB has a very strong theoretical base, with hundreds of studies conducted using the theory (Sussman & Gifford, 2018).

Despite the critiques previously mentioned, the framework of TPB will still be used in this study to determine developers' their willingness to pay since it seems the strongest and most fitting for this particular research. TPB could give further insight into a more social perspective on developers' WTP, in contradiction to only researching WTP through differences in pricing of goods, which will be further explained in section 2.2.2. Just as Ajzen & Driver (1992) describe in their study, WTP will be treated in this research as a behavioural intention.

### 2.2.1 Contingent Valuation Method

TPB and WTP are often used together with Contingent Valuation Method (CVM) (Rekola & Mika, 2001; López-Mosquera et al., 2014; Ajzen & Driver, 1992; Bernath & Roschewitz, 2008). CVM is a survey-based method for valuation of goods with non-market values and passive use value (Mitchell & Carson, 1989). This method can fit nicely in TPB studies (Harris et al., 1989). Contingent valuation studies ask questions revealing the monetary trade-off that someone would make concerning the value of goods and services. This, being called 'stated preference', is a practical way of measuring goods without prices (Carson, 2012). Stated preference will be explained more in depth in the next paragraph.

There are multiple discussions going on in the literature about whether CVM is an appropriate method for estimating non-market values. The major criticism revolves around the validity and reliability of the method (Smith, 1993). To address these issues, CV studies should be designed in such a way that internal consistency can be tested in a later stage of the research. Although CV has its limitations, it is a promising method and can be used for generating new information (Venkatachalam, 2004). Carson et al. (2001) share the same ideas and add that most of the problems regarding CV can be resolved by careful study design and implementation. Statements with respect to CV findings being theoretically inconsistent are generally not supported by the literature. In more recent literature, Bishop & Boyle (2018) said about the CV method that "the weight of evidence suggests that CV has sufficient reliability and validity to be a useful tool to inform policy analysis and litigation, although research should continue to improve the method" (p. 577). Therefore, it can be said that CV has become a reliable method, however its limitations should be kept in mind while doing research and interpreting the results and the study should be designed carefully.

### 2.2.2 Stated and revealed preference

WTP can be measured directly and indirectly. When WTP is measured directly, this is simply called *Revealed Preference*. Revealed preference is a structural approach for the analysis and interpretation of data (Crawford & De Rock, 2014). Stated preference, on the other hand, tries to collect information on a person's preferences (Carson & Louviere, 2011). Stated preference studies rely on carefully designed surveys and their answers. Those answers should show indications of preference, which could exist out of choices, ratings or other. Most economists doubt stated preference methods since they are of the assumption that people cannot truthfully fill in questionnaires (Brown, 2000). This is

naive and limiting, since well-designed surveys can avoid many of these problems and surveys are often the best way to measure stated preference (Manski, 2000). In this study, stated preference will be used since willingness to pay is not being measured directly, but through the framework of TPB. Stated preference will give more insight into the social reasoning behind making purchases. This approach is the most suitable for this, since the purpose is trying to uncover when developers would like to contribute to projects, and when not to. Revealed preference is not suitable, considering it only gives insight into *which* choice is made in the end, and not *why*, being the behavioural choices (Köszegi & Rabin, 2007).

## 2.3 Conceptual model

Three predictors of *WTP* have been determined. These are *attitude toward the behaviour*, *subjective norms* and *perceived behavioural control*, which all have a causal relationship between them and *intention*. The three variables are independent variables, leading to the main variable *intention*, also being independent. *WTP* is dependent on *intention* and thus the dependent variable. *Perceived behavioural control* also includes *transparency* and *equality* and the causal relationship for these variables with *WTP* will be tested too.

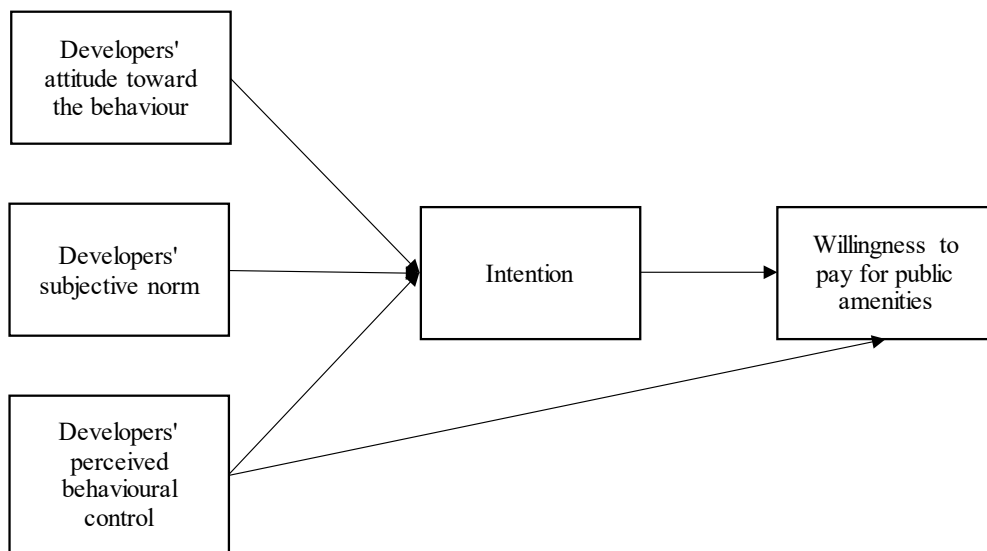


Figure 2. Conceptual model

## 2.4 Operationalisation of the conceptual framework

To make the concepts and variables being used in the conceptual model less abstract, an operationalisation framework has been developed. Climate change adaptations will also be operationalised into a usable definition. For *WTP*, a separate framework has been developed and elaborated on. *WTP* and *TPB* as a theory have been described in section 2.2.

### 2.4.1 Climate change adaptations

To determine the willingness to pay for climate change adaptations, climate change adaptations should first be defined. In this study, only adaptations that have a positive effect on property prices are taken into account. The reason behind this is that the questions asked in the questionnaire for climate adaptation, all have the same value. If adaptations that do not contribute to property prices were included, a distorted view of developers' willingness to pay will occur, since they are likely more willing to pay for profitable adaptation measures.

Rohde and Lützkendorf (2009) found that socially responsible investing, such as in sustainable property, is highly profitable. There is a lot of interest in such investments, and the opportunities

should be taken advantage of, which not all developers have been doing. To specify what investments in sustainability exists out of, Kelly and Molina (2023) have an important addition to this operationalization, since they researched what the effects of adaptation infrastructure is on property prices. They identified seven categories of project adaptation, which were *drainage; road/bridge elevation or improvements; pumping stations; shoreline stabilization; small water-holding infrastructure; large water-holding infrastructure* and *aesthetic improvements*. The last two categories were not used, since only three projects mentioned one of these categories (p. 1429). This study will also not use these categories because Kelly and Molina (2023) had no results for them. Since this adaptation infrastructure is mostly water focused, green features should also be looked into. Green features are essential in reducing the urban heat island effect and should be incorporated in every development project (Gunawardena et al., 2017). Kong et al. (2007) found that the proximity and size of a scenery forest, accessibility to parks and green spaces, and percentage of urban green spaces were significant factors in determining house factors. Escobedo et al. (2020) zoomed in on green features and added that trees with high leaf cover had a significant effect on housing prices, whereas shrubs and grass cover had a lesser effect. Hence, these features have been included to the operationalization of climate adaptations.

#### 2.4.2 Willingness to pay

WTP can be specified through Theory of Planned Behaviour, when behaviour is seen as a form of intention. TPB offers a set of variables that need to be operationalized for this specific study. The variables are *intention, attitude, subjective norm* and *perceived behavioural control* (Ajzen & Driver, 1992). These variables need to be further specified into indicators, making it possible to measure them. They will be operationalized in the next section. The summary of the operationalisation can be found in Appendix A.

WTP as a concept itself also needs to be measured. This is done through contingent valuation. What this entails, is that a choice scenario for climate change adaptations needs to be designed for the participants to indicate how much they are willing to pay in this particular scenario (Mitchell & Carson, 1989). The monetary value of climate change adaptations will be brought to light. The format will be adapted from Ajzen and Driver (1992) and Evans and Norman (1998). The indications for the monetary values will be based on De Leve et al. (2020). The most common contribution per dwelling in developer agreements is around € 5.000. Since public space and greenery often only account for twenty percent or not all in developer agreements, the range of indicators for monetary value will start at € 0 and end at € 1.000 or more.

##### 2.4.2.1 Intention

Intention is the variable for measuring willingness to pay directly. The intention to perform the behaviour, in this case paying for climate change adaptations, will be measured through TPB. For the TPB question, Ajzen (2006) will be used. It tries to uncover the intention for investing in climate change adaptations.

##### 2.4.2.2 Attitude

The indicator for attitude toward the behaviour is the experience of developers paying for climate change adaptations. Four scales will be used for measuring the experience of the developers, which are valuable, good, useful and important (Rekola & Mika, 2001; Fielding et al., 2008; Ajzen, 2006). Besides the experience developers have, their beliefs are also important. The beliefs that underlie the attitude the developers have towards paying for public amenities are called *behavioural beliefs* (Ajzen, 1985, p 14.) In this case, that would be if paying for climate change adaptations would increase financial returns in a development. What is being tested, is the awareness of developers about this topic. For this research, awareness will be seen as a characteristic of attitude (Sweldens et al., 2014; Zhong et al., 2019).

#### 2.4.2.3 Subjective norm

The indicators for subjective norm exist out of the social pressure being felt by the developers to contribute to climate change adaptations. First, it needs to be identified what actors can have social pressure on developers. Three actors have surfaced from the literature, the first one being the Dutch government. The government can put pressure on developers, since municipalities and other governmental bodies are obliged to recover their costs for the planned area. The developer and the governmental body can make agreements in private about the costs for the planned area, however, if they do not come to an agreement, they have to go public for their cost recovery, which is not the preferred option for both parties, since it is an expensive process (Muñoz Gielen & Lenferink, 2018). In this way, the government can put pressure on the developer to pay certain costs, such as climate change adaptations.

The second actor is citizens. Scally (2012) states that citizens can have a fearful attitude towards certain developments happening in their neighbourhood, such as affordable housing. Due to the concerns people have with the possible negative consequences of such developments, a NIMBY (not-in-my-backyard) attitude emerges. This mobilizes citizens, especially middle-class citizens (Matthews et al., 2014), of neighbourhoods to oppose the proposed plans, often taking institutionalized action. To overcome the NIMBY attitude, there should be more clear communication towards the citizens about developers' and governmental plans. As opposed to this, YIMBY (yes-in-my-backyard) also exists, mostly for amenities such as open space, recreation and trails. Citizens would be happy with these kinds of improvements in their neighbourhood, encouraging the developer to provide them (Brown & Glanz, 2018). Citizens thus have an important part in putting social pressure on developers for their projects, since they are able to take institutionalized action. As a third actor, scientists also have an important part to play in putting pressure on developers' ability to cover costs. They criticize current policies and projects and provide solutions for solving these obstacles (Read & Sanderford, 2017). An example of this is a critical policy analysis of the Dutch Governments' programme "*Belvedere Memorandum*", which encourages heritage conservation in spatial planning (Janssen et al., 2012). Lastly, the competition among developers is identified as a fourth actor. When competition between developers increases and gets tougher, less profits are being generated for the developer. If a development is less profitable, the developer cannot contribute as much as they may have wanted too (Łaszek & Olszewski, 2015; Wong et al., 2019). With private sector-led urban development occurring often, the importance of public-private collaboration is accentuated more for realising a development of quality (Heurkens & Hobma, 2014), creating not just competition for profits, but also for cooperation.

Since there are now four actors identified, questions about subjective norm can be formulated. There are two questions for finding out the subjective norm. These exist out of the actors think that the developer *should* contribute, and that the actor *approves* the developers contributions (Rekola & Mika, 2001; Fielding et al., 2008). One question deals with identifying the importance of the actor's opinion. Ajzen (1985) says about this:

*"Since it deals with perceived prescriptions, this factor is termed subjective norm. Generally speaking, people intend to perform a behavior when they evaluate it positively and when they believe that important others think they should perform it."* (p. 12)

To make sure the chosen actors are valued as important, the question will deal as a control to verify if this is indeed the case. Each question is asked for every different actor.

#### 2.4.2.4 Perceived behavioural control

Finally, perceived behavioural control is being measured through developers' evaluation of the action of paying for climate change adaptations. The control of the action is being measured, first through a question about the difficulty of the process (Fielding et al., 2008), second through a question about the effect of developers' contributions and third through a question about the resources for executing the

action of contributing to climate change adaptations (López-Mosquera & Sanchez, 2012). What is being added to the standard measurements of PBC, are measurements of transparency and equality. In the literature review, it was made clear that the municipality holds power over developer agreements, standardizing their policy with fixed amounts of DOs for certain types of property, fixed percentages or standard square meter prices. This creates feelings of non-transparency for the developer. Besides, municipalities each have differences in their policy, creating feelings of inequality for the developer (Hendricks et al., 2021). This has an influence on the perceived behavioural control, since it affects the intention of paying for climate change adaptations. Transparency will thus be defined as *developers' feelings about fixed DO policy by the municipality*. Next, equality will be defined as *developers' experience with difference in DO policy per municipality*.

## 3. Methodology

In this chapter, the methodology for the research will be discussed. This will be done through first, adopting a research strategy, followed by choosing the right methods. Second, the process of data collection and analysis will be clarified. Ending, the validity and reliability of this research will be discussed.

### 3.1 Research strategy

#### 3.1.1 Research philosophy

Before developing the procedures to collect data, first the research should be outlined with the research philosophy. The research philosophy is concerned with systems of beliefs and assumptions about the development of knowledge (Saunders et al., 2023). This is also partly influenced by the personal beliefs of the researcher or scientific schooling. A researcher internalizes a certain view of science and scientific methodology. The philosophy of science heavily influences what subjects the researcher studies and how research is conducted (Van Thiel, 2014). This research follows a postpositivist approach. Post-positivism is a critique of the positivist approach that there is one, single, observable reality. Compared to natural sciences, social sciences study subjects are active, sense-making human beings and the same goes for the researcher. The only difference between the researcher and the subject, is that the researcher strives for objectivity. With post-positivism, the role of the researcher as interpreter of the data is completely acknowledged and the ability to reflect on a researcher's own practices is very important (Fox, 2008). A researcher's personal views can develop into biases affecting research, even when following objective methods (Saunders et al., 2023). Post-positivism has been chosen for this study, since the research falls under social sciences and the approach to theory development is in line with the researcher's beliefs for studying a social reality. Individuals are being studied in this study, meaning there is not one true reality to perceive. The researcher is very aware of this and critically reflects on their own interpretations throughout the study. This aligns with the post-positivist approach.

As a next step, the approach to theory development should be defined. In this research, a deductive approach is being followed. Deduction involves *'the development of a theory that is then subjected to a rigorous test through a series of propositions'* (Saunders et al., 2023, p. 156). Deduction often starts with a literature review about the topic. The three characteristics deduction has are explained as follows, the first one being that it tries to explain causal relationships between concepts and variables. Second, it wants to operationalize variables to make it possible to measure them. The last characteristic of deduction is generalisation. In order for a researcher to generalize, a sample has to be selected, with the right size (Saunders et al., 2023). The highly structured design of this study fits perfectly within the set of characteristics deduction has. The research questions are based on a thoroughly researched theory, which is then tested. This is the reason why a deductive approach has been chosen for this research, in other words, a well-known is being tested. The theories available seem suitable for reporting to the aim of the research, matching deduction.

#### 3.1.2 Research design and strategy

After deciding how to approach theory development, a methodological choice should be made. This study uses a quantitative research design. With a quantitative research design, numerical data is being collected, as opposed to a qualitative research design, where non-numerical data is being generated. Further, the study is mono method, since it only uses one data collection and corresponding analysis (Saunders et al., 2023). A quantitative research design is chosen because the study tries to generalize a conclusion for a larger number of respondents, instead of investigating the motivations of a small number of people. Behaviour is being quantified, which makes it possible to interpret it using statistical methods.

Corresponding to the quantitative approach, a fitting strategy for the research must be sought out. The research strategy can be defined as the overall design or logical procedure that will be followed. With certain research strategies, certain methods are implied. Starting with the research strategy, the aim is to smaller the scope of methods step-by-step and end up at a more practical level of research. The main strategy of this study is a survey. The survey can be used for large-scale approaches and collects a considerable amount of data. This is done through a standardized form of measurement. The purpose of a survey is always to collect new data. However, there does not always have to be a hypothesis that is being tested, a person's attitudes or beliefs also fit for a survey (Van Thiel, 2014). The survey should test a representative sample and the data collection instrument should be designed carefully. Possible reasons for relationships between variables can be suggested through a survey (Saunders et al., 2023). All of the previously mentioned aspects of surveying lend themselves to a high quality research of WTP using TPB, thus a survey will be used. Besides, a survey is the most effective method for this study to collect data from respondents.

Specifying the method, a questionnaire will be used asking questions to respondents. The questionnaire will be written and consist of a list of close-ended questions. The data that the questionnaire will deliver has quantitative attributes, since it will be mostly numbers being analysed. Close-ended questions fit TPB and the questions formulated for it. The most important steps when designing a questionnaire are first; choosing the right variables, which should be operationalized, second; formulating the questionnaire items and lastly; having the items ordered in a logical manner and have a clear layout. Determining what variables will be measured is done through the theoretical framework, which is part of deductive research (Van Thiel, 2014).

Furthermore, this study is cross-sectional of sort. Cross-sectional studies are carried out at only one point in time (Levin, 2006). Only one measurement takes place, but distinctions between the units of study can be made to compare groups (Van Thiel, 2014). The focus of this study does not rely on WTP changing over time, but it is interested in the developers' opinion at the time of surveying.

## 3.2 Research methods, data collection and analysis

### 3.2.1 Research methods

The research method that will be used is Contingent Valuation Method (CVM). This method has been brought to light by Mitchell & Carson (1989). Contingent valuation (CV) studies try to determine the willingness to pay for public goods. This is done through a properly designed scenario, which must be understandable and meaningful, free of biases. The scenario is a choice scenario, where respondents need to address how much they are willing to pay to go with or without the scenario. The pros and cons of using CV within this study have been discussed in section 2.2.1. In this research, the scenario will exist of hypothetical contributions being made for climate adaptation. The actual WTP for climate adaptation will be tested in this way and will be controlled by intention. Attitude, norms and control will be tested through Theory of Planned Behaviour. TPB and its critiques have been discussed in section 2.2. As control variables, personal features will be asked of the respondent.

Besides using CVM, a literature review of the relevant literature has been carried out. This is to have a strong base of literature to build the research on. In doing so, background information on the research topic will be given and the right concepts and theories have been emerged for conducting this study.

### 3.2.2 Questionnaire design and data collection

The questionnaire starts with the question if the respondent has contributed or advised for a negotiable developer agreement in the past five years. The cut-off at five years has been made to make sure the respondent has recent knowledge of climate change adaptation and developer agreements. This question also makes sure only relevant respondents are included in the research, since the questionnaire will end after this question if the respondent answers 'no'. Another reason this question is included, is because the questionnaire is completely anonymous. By making the questionnaire

anonymous, the barrier is lowered for developers to respond, since sharing information about financial contributions to projects can be sensitive data. The questions that follow in the questionnaire ask personal features of the respondent. This information is collected to function as control variables. The complete questionnaire can be found in Appendix G.

The second part of the questionnaire is concerned with the CV scenario and TPB questions. The scenario designed for CV described the number of dwellings that were going to be developed, the size of the city, the climate related problems the city was struggling with and what specific climate adaptation measures were possible to invest in. Subsequently, respondents were asked how much they were willing to contribute for climate adaptations per dwelling in a negotiable developer agreement, for this scenario. For the TPB questions, a semantic 7-point Likert-scale was used, with a positive and negative endpoint. This is a common practice for TPB questionnaires (Ajzen, 2006). Mixed end points have not been used, since items are complete sentences. Besides, when positive end points are used in the right, the items consistently reflect higher influenced behaviour (Francis et al., 2004). Likert scales are often used within social sciences and consist out of a statement (item) and a scale where the respondent can indicate how much they agree with the item. The scores can be added up, and a high score usually implies the respondent scoring high on the general subject of the research. Likert scales have an odd number of answer categories, so that the neutral option can be in the middle (Van Thiel, 2014). The best length for a Likert scale is 7 points, since it correlates more strongly with observed significance than a 5 point scale and are most accurate and easiest to use as stated by respondents (Taherdoost, 2019). This is why this study also uses a 7-point Likert scale. As a final question, the developers were asked to leave any thoughts or remarks about the questionnaire.

Data has been collected through an online questionnaire. This questionnaire was sent by e-mail to the sample group. The questionnaire has also been shared on LinkedIn, a social media platform for businesses. The sample for this research is private Dutch developers. A developer has been defined as any employee that works at a development company and also has a function in the company related to developing projects. This has been communicated clearly through e-mail contact. Social housing associations have also been contacted, the same goes for investors with a developing department. The choice to contact multiple developers in one company has been made to get enough respondents. Not everyone within the same company has the same views on contributing to climate adaptation. Around one hundred companies have been contacted through their public e-mail address. Additionally, approximately one hundred developers have been contacted through their personal work e-mail address, and these e-mail addresses have been acquired through colleagues of the researcher, who were acquaintances of the contacted developers. This led to a response rate of approximately fifty percent. The data has been collected over a two month period, starting at the end of October, and ending halfway December.

### 3.2.3 Data analysis

#### 3.2.3.1 Structural Equation Modelling

The main mode of analysis for this research will be structural equation modelling. Structural equation modelling (SEM in short, which will be used throughout the rest of the paper) can be defined as “a class of methodologies that seeks to represent hypotheses about the means, variances, and covariances of observed data in terms of a smaller number of ‘structural’ parameters defined by a hypothesized underlying conceptual or theoretical model” (Kaplan, 2001, p. 15215). SEM is mainly designed to test well-established theories, that can suggest that certain constructs do not affect each other, variables do not load on to factors and that disturbances and measurement errors do not covary (Kaplan, 2001). When comparing SEM to multiple regression analysis, which is another suitable mode of analysis for the evaluation of direct and indirect of variables in a model, it becomes clear that SEM has more attributes suiting this study. Musil et al. (1998, p. 280) state the following about this:

Unlike multiple regression, SEM tests the conceptual and measurement models simultaneously. SEM also tests the latent variable structure, allows for multiple measures of independent variables, and adjusts for measurement error. Both SEM and multiple regression analysis can be used to test similar structural models, yet SEM utilizes the measurement model to identify the errors of measurement.

The advantage of using SEM instead of multiple regression for analysing the data in this study is that the measurement errors will be modelled, which shows if the constructs used to explain the phenomenon of behavioural intention are correctly measured. Besides, the latent variable structure in the conceptual model can be tested, which is not possible for multiple regression analysis. Moreover, Musil et al. (1998) advise to examine if the statistical procedure used matches the theoretical rationale behind the methodological choice. It can be said that SEM fits perfectly within this study. This is because TPB is a well-established theory and the complex relationships in the conceptual can be tested with SEM. Additionally, another component of SEM is assessing the model fit, which can verify if the model is compatible with the observed data. Furthermore, SEM can be seen as a confirmatory analysis. A priori specifications reflect a hypothesis and make a model that can be analysed, which makes it confirmatory. However, when data is inconsistent with the model, it lends itself to three different approaches to deal with that problem. When a strictly confirmatory application is being followed, there will be a single model retained or rejected. Another approach is the testing of alternative models, which can be applied if other a priori models are available. Different patterns between variables will be represented. The last option is model generation, which happens when an initial model does not fit the data and is modified to be tested again (Jöreskog, 1993). Kline (2016, p. 11) adds to this “The goal of this process is to “discover” a model with three attributes: It makes theoretical sense, it is reasonably parsimonious, and it has acceptably close correspondence to the data”. The approach of model generation will be applied to this research, if needed in the data analysis. The complete analysis will be done through IBM SPSS and AMOS. AMOS is an application specifically designed for doing SEM analysis.

A few assumptions have to be met for the data before conducting SEM. These are:

- The data should be normally distributed (Kumar, 2017)
- The data should not have missing values (Kumar, 2017)
- The data should not have outliers (Kline, 2016)
- Linearity and homoscedasticity (Kline, 2016)
- Absence of multicollinearity (Alin, 2010)
- Convergent, construct and discriminant validity (Kline, 2016; Awang et al., 2015)
- Reliability (Kline, 2016; Awang et al., 2015)

Normality will be tested through skewness and kurtosis, linearity and homoscedasticity will be tested through plotting the independent variables against the dependent variable in a scatterplot, multicollinearity will be tested for the independent variables with VIF-tests, validity tests will be done through confirmatory factor analysis (CFA) and finally, reliability will be tested through Cronbach’s Alpha. The assumptions will be tested in chapter 4. The data does not have any observable outliers, since no continuous scale is used as measurement. The data that is used for the analysis does not have any missing values, since all the responses with missing values have been deleted. Additionally, the model has been controlled for age, sex and years at work. The significance of the analysis will be tested with an alpha value of 0,05, unless stated otherwise. According to Miller & Ulrich (2019), an alpha of 0,05 is the optimal value in most situations.

### *3.2.3.2 Qualitative remarks*

The questionnaire gave the possibility to respondents to leave any questions or remarks. This was done to give the researcher the possibility to reflect upon the statistical findings. With this information of the respondents, recommendations for future research can be made and also the limitations of the

research can better be sketched out this way. With some respondents, there has been contact by telephone or e-mail, to continue discussing the research. In section 4.4 and chapter 5, the results of this question and contact with the respondents will be discussed. It is important to note that this does not mean that a qualitative analysis has been done, which makes that the comments should be interpreted with care, since they do not hold any methodological value. 36 respondents in total decided to leave a comment at the end of the questionnaire, with is more than a third of the total respondents.

### *3.2.3.3 Data editing*

Before conducting the analysis, the data has to be edited first. First, all the incomplete responses were deleted from the dataset. 140 responses were collected, however only 89 responses were complete. This had various reasons, the first being that some of the respondents failed the control question and the second that respondents stopped responding after the personal characteristics questions. Further, data has been transformed from text into numbers (usable data), with values attached to the numbers. All the Likert-scale questions are on an interval scale; age, years working and WTP are ordinal scale; and sex and province are nominal. All the data has been coded to have the highest number corresponding with the highest or most positive answer in the questionnaire.

All the questions have been recoded into different names, which works faster in the analysis and is less cluttered. The overview of variables recoded can be found in Appendix F. Also, for attitude, norms, control and intention, variables have been computed by the means of the measuring items. This has been done so they can be plotted for different statistical tests, as seen in chapter 4.

## 3.3 Validity and reliability

To enhance the quality of the study, validity and reliability should be measured in quantitative research (Heale & Twycross, 2015). These two concepts will be first discussed separately, starting with validity and following reliability.

### 3.3.1 Validity

The extent to which a concept is measured in a study, is called validity. There are three major types of validity. These types are content validity, construct validity and criterion validity. The first type, content validity, looks at whether the instrument covers all of the content that it should concerning the variable. Following up, construct validity is about whether the research methods used measure the right concept. This can be shown through homogeneity, convergence and theory evidence. The last type is criterion validity. Criterion validity means that the test measures the same as a criterion, which is an instrument that measures the same variable. Criterion validity can be measured through convergence validity, divergent validity and predictive validity (Heale & Twycross, 2015).

This study tries to accurately measure its concepts by following these three validity types. To guarantee the content validity, a literature review is performed and a theoretical framework is drafted to be aware of all the possible variables relevant to this study. The conceptual model has been formed through the variables that came out of this. Next, the homogeneity will be shown through internal consistency in section 4.1.5. The CFA also tests construct validity, as shown in section 4.2. Secondly, the study displays convergence, since the instrument being used, CVM, is as concluded in section 2.2.1, often used for measuring WTP. The results show that the data matches TPB almost completely, which means there is theory evidence, strengthening the argument of construct validity. This can be observed in chapter 5. Finally, criterion validity will be demonstrated by convergent and divergent validity. The convergent validity has been elaborated on in section 4.1.3 and divergent validity in section 4.1.4.

### 3.3.2 Reliability

Reliability concerns itself with the consistency of a measure. Measuring reliability exactly is not possible, however it is possible to give an estimation through different measures. These measures are homogeneity, stability and equivalence. Homogeneity means the consistency between measures. The

most commonly used test is Cronbach's Alpha (Heale & Twycross, 2015), which will be used in this study too. The results for Cronbach's Alpha can be found in section 4.1.5. Stability can be described as the consistency of the results using an instrument with repeated testing. This can be tested by giving the participant the questionnaire twice under similar circumstances and making a statistical comparison between the two results. This has not been done for this study, so it is unsure if the results show stability. Equivalence is the final measurement. It is about the consistency among responses of the multiple users of an instrument and be assess through inter-rater reliability (Heale & Twycross, 2015). In the case of this study, there are not any problems expected with equivalence, since the results will not be given multiple ratings by different users.

## 4. Results

In this chapter, the results of the analysis will be discussed. Section 4.1 consists of the descriptive statistics and the assumptions. First, the summary of the variables will be presented, which will give information about the dataset. Second, the assumptions required for the SEM analysis will be checked for the data. In section 4.2, a confirmatory factor analysis (CFA) will be conducted and analysed, which will give information about the construct validity. In section 4.3, the SEM analysis will be conducted, exploring the hypothesized paths in the conceptual model. Finally, in section 4.4, the qualitative results will be discussed, which is helpful for matching the outcomes of the analysis to what respondents have commented. Often, the variable names will be mentioned in this chapter. For translation back to the questions asked, Appendix F can be consulted.

### 4.1 Descriptive statistics and assumptions

#### 4.1.1 Summary of the variables

The questionnaire was filled in completely by 89 respondents. Based on the result of the descriptive statistics analysis as shown in Table 1, it is revealed that developers' behaviour is mostly positive or tend to agree toward climate adaptation efforts because, on average, they give the value above 4 (neutral) in the 7-point Likert scale (1: completely disagree and 7: completely agree).

Interestingly, however, there are three variables in which the developers tend to disagree with the statements (the average value below 4). Two variables are related to Subjective Norms concerning the other developers as an actor (Norms\_Developers\_1 and Norms\_Developers\_3), and one is related to Perceived Behavioural Control (PBC\_Evaluation\_4). From the first variable, it is revealed that on average, developers tend to perceive that their peers (other developers) do not expect them to contribute to climate adaptation efforts and from the second variable, it is revealed that, on average, developers do not value the opinion of developers, especially concerning the climate adaptation efforts. The third variable reveals that, on average, developers think they do not have enough money to contribute to climate adaptation. When looking at the question if developers value the opinion of the actors, it can be said that they do from the government, citizens and scientists, since the means score above neutral (4), but they do not value the opinion of other developers.

Descriptive Statistics				
	N	Minimum	Maximum	Mean
Intention_1	89	1	7	5,16
Intention_2	89	1	7	5,13
Attitude_Experience_1	89	2	7	5,97
Attitude_Experience_2	89	2	7	5,80
Attitude_Experience_3	89	2	7	5,79
Attitude_Experience_4	89	2	7	5,91
Attitude_Beliefs_1	89	1	7	4,81
Norms_Government_1	89	1	7	5,22
Norms_Government_2	89	1	7	5,38
Norms_Government_3	89	1	7	4,44
Norms_Citizens_1	89	1	7	4,45
Norms_Citizens_2	89	1	7	4,73
Norms_Citizens_3	89	1	7	5,28
Norms_Scientists_1	89	2	7	5,18
Norms_Scientists_2	89	1	7	5,12

Norms_Scientists_3	89	2	7	4,96
Norms_Developers_1	89	1	7	3,99
Norms_Developers_2	89	1	7	4,61
Norms_Developers_3	89	1	6	3,85
PBC_Evaluation_1	89	1	7	4,24
PBC_Evaluation_2	89	2	7	4,63
PBC_Evaluation_3	89	2	7	4,73
PBC_Evaluation_4	89	1	6	3,35
PBC_Evaluation_5	89	1	7	4,22
PBC_Evaluation_6	89	1	7	4,60
PBC_Process_1	89	3	7	5,47
PBC_Process_2	89	3	7	5,21
Q1_AO	89	1,0	1,0	1,000
Q2_Leeftijd	89	1,00	5,00	3,5169
Q3_Provincie	89	1,00	13,00	4,3483
Q4_jarenactief	89	1,00	6,00	4,4607
Q5_geslacht	89	1,00	2,00	1,8315
Q8_WTP	89	1,00	6,00	3,6404

Table 1. Descriptive statistics

Personal characteristics and WTP of the developers are represented in frequency tables in addition to the descriptive statistics. As seen in Table 2, the largest number of respondents were in the age category 46 until 55. This corresponds with that the largest portion of respondents are active within the sector of land development for at least 16 years (48,3%), as seen in Table 3. This means that on average, the respondents have been in the profession of development for a long time at a bit older age.

Age		
	N	%
18 - 25	2	2,2%
26 - 35	14	15,7%
36 - 45	24	27,0%
46 - 55	34	38,2%
56 - 65	15	16,9%

Table 2. Age frequencies

Years at work		
	N	%
0 - 2 jaar	2	2,2%
3 - 5 jaar	7	7,9%

6 - 10 jaar	10	11,2%
11 - 15 jaar	13	14,6%
16 - 25 jaar	43	48,3%
26+ jaar	14	15,7%

Table 3. Years at work frequencies

Eminently, more men than women filled in the questionnaire, as seen in Table 4. To see if the respondents are geographically spread out through the country, the provinces of the company where the respondents were working at, at time of filling in the questionnaire, was also asked. The results can be seen in Table 5. Every province is represented in the dataset, however Noord-Holland, Zuid-Holland, Utrecht and Gelderland make up almost three quarters of the respondents (74,2%).

Sex		
	N	%
Vrouw	15	16,9%
Man	74	83,1%

Table 4. Sex frequencies

Province		
	N	%
Noord-Holland	20	22,5%
Zuid-Holland	16	18,0%
Zeeland	1	1,1%
Utrecht	16	18,0%
Noord-Brabant	7	7,9%
Limburg	1	1,1%
Gelderland	14	15,7%
Overijssel	8	9,0%
Drenthe	1	1,1%
Groningen	2	2,2%
Friesland	1	1,1%
Flevoland	1	1,1%
Niet van toepassing	1	1,1%

Table 5. Province frequencies

Finally, WTP is being looked at. In Table 6, it can be seen that 12,4% of the respondents do not want to contribute to climate adaptation. On the other hand, a majority of the respondents do want to contribute (87,6%). The largest portion of this group wants to contribute more than € 1000 per dwelling in a development (23,6%). Overall, looking purely at means and frequencies, developers seem to have positive behaviour towards climate adaptation.

Q8_WTP		
	N	%
Geen extra bijdrage	11	12,4%
€ 1 - € 250	15	16,9%
€ 251 - € 500	18	20,2%
€ 501 - € 750	17	19,1%
€ 751 - € 1000	7	7,9%
Meer dan € 1000	21	23,6%

Table 6. WTP frequencies

#### 4.1.2 Normality

The first assumption that should be checked before conducting the SEM analysis, is normality. This will be done through a Skewness and Kurtosis-test. Since the size of the table, the results of the Skewness and Kurtosis-test can be found in Appendix B. The cutoff value for if variables are within an acceptable range of skewness or kurtosis are respectively  $< 3,0$  and  $< 10,0$  (Kline, 2016). Non-normal data can cause issues with the techniques chosen for conducting SEM (Kumar, 2017), since the standard estimation method for SEM is maximum likelihood, which assumes normality (Kline, 2016).

Looking at Appendix B, we can see that there are no conflicts found in the data for skewness, since all of the variables score  $< 3,0$ . For kurtosis, the same conclusion can be made, since all variables score  $< 10,0$ . The variable with the most kurtosis is Attitude\_Experience\_1, however the variables still only scores 3,734, which is still widely within acceptable range. With these results, it can be said that the data meets the assumption of normality and maximum likelihood can be used for as estimation method in SEM.

#### 4.1.3 Linearity and homoscedasticity

The homoscedasticity and linearity of the dataset need to be tested to be sure that the right tests for a model are chosen. It is a part of multivariate normality (Kline, 2016). When performing a standard multiple regression analysis, only a linear relationship between the dependent and independent variables can be accurately measured. However, not all relationships between variables are linear in social sciences, hence the relationship should be examined. When the relationship is non-linear, there is an increased risk in Type I and Type II errors. Heteroscedasticity, the opposite of homoscedasticity – when the variance of standard errors differ at different values of the independent variable, can lead to incorrect and distorted findings and weaken the analysis, increasing the chance of a Type I error (Osborne & Waters, 2002).

Homoscedasticity and linearity will be plotted for the independent variables (attitude, norms and control) against the dependent variable (intention). The scatterplots for these variables can be found in Appendix C. The three relationships are all linear. Regarding homoscedasticity, the residuals are generally consistently plotted along the fit line. They do tend to concentrate along the top part of the fit line, however this concentration does not seem problematic. A fan shape of the residuals is less desirable, but this is not the case for the variables. This means that the assumptions for linearity and homoscedasticity have been met.

#### 4.1.4 Absence of multicollinearity

The next assumption is absence of multicollinearity. Multicollinearity means the linear relationship between two or more explanatory variables. If multicollinearity is present, it can cause problems with the reliability of the estimates of model parameters (Alin, 2010). A VIF-test can inspect if there is multicollinearity present. This has been done for the explanatory variables attitude, norms and control. The cutoff value that will be used to test if there is absence of multicollinearity will be  $< 3,0$ , which is a precise way of measuring multicollinearity (Zuur et al., 2009). It can be concluded from Table 7 that

there is no multicollinearity present for the explanatory variables, since all variables score below 3, meaning the assumption has been met.

VIF-test		
Model		Collinearity Statistics
		VIF
1	(Constant)	
	Attitude	1,429
	Norms	1,491
	Control	1,415

Table 7. VIF-test

#### 4.1.5 Internal consistency and reliability

To be sure if the responses are consistent across items of a measure, Cronbach's Alpha can be calculated. If the measures are not internally consistent, it is better to leave them out of the analysis, especially for latent variable analysis (including SEM) (Kline, 2016). A sufficient alpha should be  $> 0,70$  to have an acceptable level of measurement (Taber, 2017). For every latent variable, Cronbach's Alpha will be calculated and interpreted.

##### 4.1.5.1 Attitude

In Table 8, it can be seen that the Cronbach's Alpha for the measurement scale is reliable and internally consistent, since  $\alpha = 0,835$ . Looking at Table 9, it is remarkable that  $\alpha$  can be higher if Attitude\_Beliefs\_1 is deleted. This will be taken into account when conducting the factor analysis and SEM.

Reliability Statistics	
Cronbach's Alpha	N of Items
,835	5

Table 8. Cronbach's Alpha attitude

Item-Total Statistics	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Attitude_Experience_1	22,30	13,964	,844	,754
Attitude_Experience_2	22,47	13,434	,850	,746
Attitude_Experience_3	22,48	14,343	,700	,786
Attitude_Experience_4	22,36	14,142	,790	,766
Attitude_Beliefs_1	23,46	15,433	,268	,943

Table 9. Cronbach's Alpha attitude per item

##### 4.1.5.2 Perceived behavioural control

Perceived behavioural control is just as attitude, also reliable and internally consistent since  $\alpha = 0,768$  (Table 10). Looking at Table 11, it can be seen that there are no substantial differences if an item were to be deleted. Removing PBC\_Process\_1 can make the largest difference in  $\alpha$ , so it was decided to watch the variable.

Reliability Statistics	
Cronbach's Alpha	N of Items
,768	8

Table 10. Cronbach's Alpha control

Item-Total Statistics	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PBC_Evaluation_1	32,21	26,579	,604	,715
PBC_Evaluation_2	31,82	29,467	,518	,734
PBC_Evaluation_3	31,72	29,250	,571	,726

PBC_Evaluation_4	33,10	28,910	,528	,732
PBC_Evaluation_5	32,22	30,563	,408	,753
PBC_Evaluation_6	31,85	28,558	,543	,729
PBC_Process_1	30,98	33,613	,253	,774
PBC_Process_2	31,24	32,819	,296	,769

Table 11. Cronbach's Alpha control per item

#### 4.1.5.3 Subjective norms

The Cronbach's Alpha for subjective norms is reliable, since  $\alpha = 0,797$  (Table 12). Looking at Table 13, Norms\_Developers\_3 can be deleted to increase the Cronbach's Alpha. It was decided to watch the variable.

Reliability Statistics	
Cronbach's Alpha	N of Items
,797	12

Table 12. Cronbach's Alpha norms

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Norms_Government_1	51,99	58,966	,506	,776
Norms_Government_2	51,83	59,005	,446	,782
Norms_Government_3	52,78	62,381	,335	,792
Norms_Citizens_1	52,76	60,523	,432	,783
Norms_Citizens_2	52,48	55,957	,648	,760
Norms_Citizens_3	51,93	62,427	,364	,789
Norms_Scientists_1	52,03	57,306	,594	,767
Norms_Scientists_2	52,09	56,287	,590	,766
Norms_Scientists_3	52,26	62,694	,367	,789
Norms_Developers_1	53,22	60,813	,414	,785
Norms_Developers_2	52,61	62,719	,362	,789
Norms_Developers_3	53,36	65,051	,199	,804

Table 13. Cronbach's Alpha norms per item

#### 4.1.5.4 Intention

Finally, intention will be measured. Since intention is only made up out of two items, it is not meaningful to look at the Cronbach's Alpha if an item were to be deleted. The  $\alpha$  for intention is 0,934, which is very high, which can be seen in Table 14. This means that the assumption of reliability and internal consistency has been met, since all variables have a  $\alpha$  above 0,7.

Cronbach's Alpha	N of Items
,934	2

Table 14. Cronbach's alpha intention

## 4.2 Confirmatory factor analysis

Before SEM can be conducted, a form of factor analysis must first need to be performed. For SEM, this is Confirmatory Factor Analysis (CFA). What makes CFA differ from a more traditional form of factor analysis (Exploratory Factor Analysis, for example) is that the relations between variables are specified beforehand. This makes that the tests for construct validity are more powerful. In CFA, the researcher determines where the variables should load and as a result, it will be made clear if the model fits the data. A better fit can be created through removing variables or adding new relationships. But if the model fits good, it does not guarantee that there could be a better fitting model. The basis for CFA is the theory used in the research, this is where decisions for model enhancements or reductions should be based upon (Streiner, 2006).

For CFA, the construct 'perceived behavioural control' has been split into evaluation and process. This has been done because the items that measure process have been added by literature findings, and not

TPB. With the results of the CFA, it can be concluded if the added items have been strong and valid additions to the model. Norms has also been split up into four different variables. This is because the potential influential actors have been defined by literature, and if one actor tests better than the other actor, the test will as a result show skewed results. With this information, one of the actors can be deleted, to strengthen the model if necessary.

The first step is to recreate the original model in AMOS and test how well the estimates perform. This model can be found under Appendix D.1. The loading estimates should be above 0,5 to be a good item. If this is not the case, those items could potentially be deleted if the researcher decides this will improve the model and suits the theory underlying the model (Hair et al., 2019). The items that perform below this threshold are (Appendix D1.2):

- Norms\_Government\_3,
- Norms\_Scientists\_3,
- Norms\_Developers\_1, 2 and 3,
- Norms\_Citizens\_1 and 3,
- PBC\_Evaluation\_1, 4, 5 and 6,
- Attitude\_Beliefs\_1

Looking at model fit, there are multiple indicators that show if the model is a good fit for the data. The indicators that will be used in this study are:

- Chi-square, cutoff value for exact-fit hypothesis is  $p > 0,05$  (Kline, 2016)
- CMIN/DF, cutoff value for acceptable fit is  $< 3$  (Kline, 1998)
- CFI, cutoff value for acceptable fit  $> 0,90$  (Fan et al., 1998)
- RMSEA, cutoff value for close fit  $< 0,05$ , reasonable fit  $< 0,08$ ,  $> 0,10$  not recommended (Browne & Cudeck, 1992)

The original model performs only in terms of CMIN/DF (= 2,003, Appendix D1.1). This means that the model, if possible, needs to be modified, since it does not score acceptable for the other fit indicators. As a next step, the discriminant validity and convergent validity will be looked. These results could lead to modifications in the model too. The discriminant and convergent validity will be tested through Average Variance Extracted (AVE) and Construct Reliability (CR). As seen in Appendix D1.3, lots of modifications for the model need to be made to have good discriminant and convergent validity. The AVE should be above 0,50 and the CR above 0,70 as threshold. For discriminant validity, the square root of AVE should also be lower than the correlation between variables (Hair et al., 2019). In Appendix D1.3, a lot of problems with discriminant validity are indicated. However, this is partly due to norms being split up into separate variables, meaning the variables correlate too much with each other for them to have discriminant validity due to the different actors being measured by the same items. This is why for the variables of norms, the discriminant validity test will not be interpreted. There are also issues with AVE for other variables instead of norms. This means that this model does not perform good, so it will be adjusted.

The first criterion for adjustment will be the loading estimates. The following variables will be removed, since they perform below 0,5:

- Attitude\_Beliefs\_1
- PBC\_Evaluation\_5 and 6
- Norms\_Developers 1, 2 and 3
- Norms\_Scientists\_3
- Norms\_Government\_3

The choice has been made to not remove PBC\_Evaluation\_1 and 4 since PBC\_Evaluation\_1 has a significant P-value and PBC\_Evaluation\_4 will be correlated with 1 later on in the SEM model, based

on modification indices. This practice will be explained section 4.3.2, which will improve the loadings. Looking at convergent validity, Norms\_Government\_1 will also be removed since the AVE is below 0,50. It is in line with the conclusion made in section 4.1.1 that developers do not value their peers, that developers as a predictor has been completely removed. The items compared together do not predict intention significantly.

These modifications lead to a new, adjusted model, which can be found under Appendix D2. The adjusted model shows good convergent and discriminant validity (Appendix D2.3). All the estimates are significant ( $p < 0,05$ ) and have loadings above 0,50 (Appendix D2.2). It also scores decent on model fit (Chi-square  $p = 0,000$ ); fails the exact-fit hypothesis; CMIN/DF = 1,656, indicating good fit; CFI = 0,931, indicating good fit; RMSEA = 0,086, indicating close to reasonable fit (Appendix D2.3) As a result, this model will be used to do the SEM analysis.

### 4.3 Structural equation modelling

The last step of the data analysis is conducting the SEM analysis. The model will be controlled for personal characteristics first, and transparency and equality second. The model that follows out of these modifications will be used to study the paths between variables.

#### 4.3.1 Control variables, transparency and equality

First, the estimates will be calculated for the model. The model controls for age, sex and years at work and explores if transparency and equality can predict intention and WTP. This means that there will be a direct path from the controls to WTP and from transparency and equality to intention and WTP. As seen in Appendix E1, none of the controls have a significant effect on WTP ( $p > 0,05$ ). Looking at the standardized regression weights, all the controls are below 0,50, with years at work having the highest estimate relative to the other controls (0,263), but still not acceptable enough. Age has a very small negative estimate (-0,166). Sex has the least influence, with a value of 0,076. Transparency and equality do not have a significant influence on Intention too ( $p > 0,05$ ) and have bad loadings (PBC\_Process\_1: -0,40, PBC\_Process\_2: 0,131). The controls have been removed after this test. The direct path from PBC\_Process\_1 and PBC\_Process\_2 to Intention has also been removed after this test.

#### 4.3.2 Estimates and modification indices

The second step is looking at the estimates of the model and the modification indices. The model also tests the relationship between PBC and WTP, as seen in the conceptual model. Observed in Appendix E2 is that almost all the variables have a significant effect, however this is not the case for the following paths:

- PBC > Intention,
- PBC > PBC\_Process\_1,
- PBC > WTP.

The regression weights are also below 0,50 for the following paths:

- PBC > I,
- N > I,
- PBC > PBC\_Process\_1,
- PBC > PBC\_Process\_2,
- PBC > PBC\_Evaluation\_1,
- PBC > Evaluation\_4,
- PBC > WTP.

Clearly, there is a problem with PBC. Looking at modification indices (Appendix E3), it can be revealed that correlating the error terms can improve the model. Approximately, a M.I. of 20 will be

taken into account to correlate the error terms. The error terms with a M.I. of approximately 20 are the following:

- PBC\_Evaluation\_1 with PBC\_Evaluation\_4 (e25 – e28);
- PBC\_Process\_1 with PBC\_Process\_2 (e21 – e22).

There is a lot of debate on correlating residuals in literature. However, the practice should be more accepted, since ignoring it could lead to misspecification of the model (Cole et al., 2007). The variables that will be correlated have a lot in common in terms of measurement item. This justifies the correlations that will be made.

After correlating the residuals, a new table of estimates will be calculated, which can be found under Appendix E4. Every predictor is significant, except for PBC > Intention and PBC > WTP ( $p > 0,05$ ). Looking at the factor loadings, the same results show as the estimates. All the paths have strong loadings ( $> 0,50$ ), except for PBC > Intention and PBC > WTP.

#### 4.3.3 Assessing model fit

The final step of doing a SEM analysis is to assess the model fit. Without good model fit, the calculated estimates do not have much power in its significance. The model fit statistics can be found under Appendix E5. Starting with the chi-square, the p value is still below 0,05 and rejects the exact fit hypothesis. CMIN/DF is 1,587, which is good. The CFI is 0,931, which also indicates good model fit. Finally, the RMSEA is 0,082, which is very close to 0,08, meaning acceptable fit. Overall, it can be said that the model is decently fitting. Model fit indices have a tendency to be slightly biased downward for small sample sizes (under 100 and 200) (Fan et al., 1999), which this study has. This is the reason that in this study the results for model fit will be accepted and subsequently, the estimates will be interpreted and translated to a conclusion.

#### 4.4 Interpretation and discussion of the results

Looking at the results, it can be seen that attitude and subjective norms are good predictors of behavioural intention. Especially strong predictors within attitude are Attitude\_Experience\_1, Attitude\_Experience\_2 and Attitude\_Experience\_4. This is due to all of them having an estimate of 1 or above, p values of less than 0,001 and loadings of 0,9 and above. However, Attitude\_Experience\_3 is also a strong predictor, since it also has a p value of less than 0,001 and a loading close to 1 (0,995).

Following, the strongest predictors within subjective norms will be presented. The variable with the highest loading (0,951) is Norms\_Scientists\_2. Norms\_Government\_2 has the weakest loading (0,572). All the variables have a significance of a p smaller than 0,001, indicating strong predictors of subjective norms.

PBC will be dealt with at last. PBC will first be compared on factor loadings. The best scoring variable is PBC\_Evaluation\_3, with a loading of 0,991 and a p value of 0,007. The worst scoring variable is PBC\_Process\_1, with a p value of 0,027. All of the p values are significant since they are below 0,05.

The variable with the most influence is attitude. This is because all of the variables within attitude have strong loadings and p values. Attitude has a p value smaller than 0,001 for predicting intention, which is the strongest of the three predictors of intention. Following up, subjective norms is also a significant predictor of intention, with a p value of 0,036. This effect is less strong than the effect attitude has on intention. Subjective norms are not an significant predictor of intention with a p value of above 0,05 ( $p = 0,102$ ).

Finally, it is critical to note that intention is a good predictor of behaviour (WTP), with a p value of smaller than 0,001. If it had occurred that intention was in fact not a significant predictor of behaviour, TPB would have not been an appropriate fit for explaining WTP in this study. However, this is not the case and TPB fits nicely with WTP.

It can be said that the most important conclusion of this study is that attitude and subjective norms influence how much developers are willing to pay for climate change. Remarkable is that perceived behavioural control does not play a part in how much developer have the intention and willingness to pay for climate adaptation, especially since other research has shown that it is an important factor for developers in how much they want to contribute (Hendricks et al., 2021; Van der Krabben et al., 2023). A possible reason for this is that due to contractual agreements between developers and municipalities, developers have no choice but to contribute to climate adaptation, even if their personal preference is not to contribute. Developers' attitude against climate adaptation plays a bigger role in willingness to pay. This effect could potentially overshadow perceived behavioural control. If someone is really not convinced that contributing to climate change is a good thing, then it does not matter if more perceived behavioural control is experienced. This can be seen in some of the comments the respondents left at the end of the questionnaire:

*“If we do not have to contribute via a developer agreement, we think it is our own duty to do this in the development”*

*“In general, I am of the opinion that development itself should make maximum efforts on climate adaptation”*

*“Climate adaptation should be a starting point for every development”*

These quotes emphasize that developer have a positive attitude towards climate adaptation and are convinced that contributing to climate adaptation is a necessity, they are taking their own responsibility and are not reliant on contractual agreements.

Continuing on the topic of PBC, developers say that they need more transparency and equality in municipalities policy, however this study shows that this actually does not matter for how much they are willing to pay. The qualitative results of this study show this contrast too, quoting a respondent:

*“I do not think there are any developers that does not see the usefulness and necessity of climate adaptation and also want to contribute to this, however it is the accumulation of demands, besides climate adaptation, which makes development projects unfeasible and that no contribution can be made”.*

Meanwhile, there actually are developers that are of the opinion that contributing to climate adaptation is not important. But, a lot of developers think that if they had more control over their expenses for climate adaptation, they would contribute more to climate adaptation, as shown in the quotes. This would have not been the case if they had a negative attitude against climate adaptation. It would not have mattered if they experienced more control, they would still not have contributed if they had a negative attitude. This highlights the significance of developers' attitudes towards WTP for climate adaptation. An important remark to make about this interpretation is that this study only measures the intention at this moment, and if PBC changes in the upcoming years, the intention could change.

Looking at subjective norms, it was observed that other developers did not have an influence on the decision-making process of the respondents. Developers do not let their behaviour lead by what similar developers do. This has also been mentioned by one respondent:

*“Every developer should be treated equally, so the position of other developers is not that interesting”*

For citizens, scientists and the government, there was an effect seen on how much developers were willing to pay. The reason for this is that projects need public support, otherwise they would experience a lot of backlash against their development, leading to project delays and a negative image. Scientists were an especially good predictor for subjective norms. This could mean that developers value the opinion of scientists the most and let their decisions lead by scientific research.

Finally, it was observed that personal characteristics did not influence how much respondents were willing to pay. This shows that contributing is truly a personal behavioural choice, instead of, for example, being influenced by coworkers in the same profession over time.

## 5. Conclusion

In this chapter, the research questions will be answered, using the results of the data analysis. Next, the theories mentioned in the scientific relevance will be revisited to strengthen or adjust them, based on the conclusion of this study. Following this, the practical implications of this study will be elaborated upon. With the term practical implications, policy changes or actionable suggestions is meant. Finally, there will be a reflection on this study and its limitations, and suggestions for further research will be discussed.

### 5.1 Answering the research questions

The research questions will be answered systematically, starting with the sub-questions and ending with the main research question.

#### 5.1.1 First sub-question

Beginning with the first sub-question, which is as follows: ‘To what extent do the developers intend to contribute to financing urban climate adaptation infrastructure developments?’, it can be said that on average, developers have a positive intention towards contributing to financing climate adaptation. Intention has been measured by two items, which are Intention\_1 and Intention 2. Respectively, they have mean of 5,13 and 5,16, which is higher than neutral (4). Together, they have a Cronbach’s Alpha of 0,934, showing internal consistency and reliability within the measurement. The intention predicts the actual WTP accurately too ( $p = 0,001$ ). Answering the sub-question, developers generally have the intention to contribute to climate adaptation, and they are more likely to contribute than they are not to. This shows in their actual behaviour too.

#### 5.1.2 Second sub-question

The next question that needs answering is: ‘How willing are the developers to contribute to financing urban climate adaptation infrastructure developments?’. A majority of developers is willing to pay for financing climate adaptation (87,6%). However, the number of contributions per dwelling does differ. The largest portion of developers that want to contribute, want to contribute more than € 1000 per dwelling. In response to the sub-question, it was found that developers are greatly willing to pay for climate adaptation, with nearly a quarter expressing a desire to contribute the maximum amount possible in this study.

#### 5.1.3 Third sub-question

The third question is ‘What are the developers’ attitudes toward the decision to contribute to the financing of urban climate adaptation infrastructure developments?’. To answer this question, three things need to be assessed first. The first one being how the five items of attitude perform in predicting attitude. The CFA can give answers to this question. Attitude\_Beliefs\_1 was deleted since it did not estimate attitude appropriately. The other 4 items were highly significant predictors of attitude ( $p < 0,001$ ). The Cronbach’s Alpha for attitude shows this too, with an  $\alpha$  of 0,943 if Attitude\_Beliefs\_1 is deleted.

The second step is to look at how the attitudes scored on average. Attitude\_Experience 1, 2, 3 and 4 scored respectively a 5,97, 5,80, 5,79 and 5,91. This is far above neutral (4) for the Likert scale, meaning that, on average, the developers have a positive attitude towards contributing to climate adaptation and that they find paying for climate adaptation valuable, good, useful and important.

As a third step, it will be looked at how well attitude predicts intention. This has been shown in the SEM analysis, where attitude has a  $p$  value smaller than 0,001, meaning that attitude significantly predicts attitude. With this information, the sub-question can be answered. Developers’ attitudes are, generally, very positive towards contributing to the financing of urban climate adaptation infrastructure developments. The attitude of developers is a crucial factor for assessing the behavioural intention of contributing to climate adaptation. If the developer is more positive towards contributing for climate adaptation, they are more likely to contribute and to contribute higher amounts.

#### 5.1.4 Fourth sub-question

The same structure of the previous question will be applied to answer the fourth sub-question, being ‘Which parties could influence the developers’ decision to contribute to financing urban climate adaptation infrastructure developments?’. First, the CFA will be consulted for determining if all items measure subjective norms properly. This is not the case, since Norms\_Developers\_1, 2 and 3, Norms\_Citizens\_1 and 3, Norms\_Scientists\_3 and Norms\_Government\_3 do not predict subjective norms acceptable enough. Furthermore, Norms\_Government\_1 is also not a good predictor of subjective norms, since it has bad convergent validity. The variables left are Norms\_Scientists\_1 and 2, Norms\_Citizens\_2 and Norms\_Government\_2. These four variables are all highly significant predictors of subjective norms ( $p < 0,001$ ). They have internal consistency and reliability too ( $\alpha > 0,804$ ).

Secondly, it will be assessed what the mean score is for subjective norms. This is for Norms\_Scientists\_1: 5,18, Norms\_Scientists\_2: 5,12, Norms\_Citizens\_2: 4,73 and Norms\_Government\_2: 5,38. It can be argued that all items show positive norms against financing climate adaptation, since they score above 4 (neutral), with some items more positively than others.

As a final step, it will be determined whether norms accurately measure intention. From the results, it has become clear that this is indeed the case, as evidenced by a slight but significant effect ( $p = 0,036$ ). With this information, the sub question can be answered. The parties that could influence the intention of developers to contribute to financing urban climate adaptation infrastructure developments are scientists, citizens and the government. This means that the opinions of fellow developers do not matter for the willingness of developers to finance climate adaptation. The social pressure from scientists, citizens and the government being experienced by developers does significantly matter for their behavioural intention. If they put more pressure on developers, developers are more likely to contribute more to climate adaptation.

#### 5.1.5 Fifth sub-question

The last sub-question is ‘What is the perception of developers concerning the adversities, or lack thereof, to contribute to financing urban climate adaptation infrastructure developments?’. The same three step approach for answering the previously mentioned sub-questions is repeated. In the CFA, it can be seen that PBC\_Evaluation\_5 and 6 perform badly, leading to those items being removed as measurement for PBC. The items about transparency and equality (PBC\_Process\_1 and 2) were split up from the other items in the CFA, since they were added to test the literature. In the SEM analysis, the kept items all predicted PBC significantly.

The means for the PBC items were as follows: PBC\_Evaluation\_1: 4,24, PBC\_Evaluation\_2: 4,63, PBC\_Evaluation\_3: 4,73, PBC\_Evaluation\_4: 3,35, PBC\_Process\_1: 5,47, PBC\_Process\_2: 5,21. Except for PBC\_Evaluation\_4, all items show that developers are positive about the control they experience for financing climate adaptation.

The last step is to look at how well PBC predicts behavioural intention and actual WTP. There is no significant effect found for both these relationships (respectively,  $p = 0,102$ ;  $p = 0,558$ ). Given this fact, the sub question can be answered. Developers’ perceptions on financing urban climate adaptation infrastructure are generally positive. Developers do think they have control over their behaviour. The only exception is control over their financial means (PBC\_Evaluation\_4). They were also of the opinion that if municipalities were more equal and transparent towards developers, they would contribute more to climate adaptation. This can also be seen in the responses of the study, with the following quote:

*“The question is not as black and white as stated. The municipality often demands a lot more than just climate adaptation. Hence, the municipal costs rise very quickly and makes it often obligations in stead of free choice”.*

However, PBC did not significantly predict behavioural intention and WTP. This means that the amount of control developers experience does not matter for their actual intention and actual behaviour, which goes against some of the comments made by the respondents.

#### 5.1.6 Main research question

Finally, given these points, the main research question can be answered, which is as follows: ‘To what extent can developers’ willingness to pay for climate adaptation be predicted through the components of behavioural intention in theory of planned behaviour?’. The SEM analysis shows that intention is a good predictor for WTP. This means that TPB fits perfectly within a contingent valuation framework for measuring WTP. Intention has been predicted significantly by attitude and subjective norms. Developers’ behaviour is thus a relatively good indicator for willingness to pay for climate adaptation. Perceived behavioural control is the only behavioural component that does not significantly influence developers’ WTP for climate adaptation. Perceived behavioural control does also not directly influence WTP, which means there is no difference in developers’ perceived behavioural control for intending and performing the behaviour of contributing to climate adaptation. Also, as seen in section 4.2, no personal characteristics explained intention significantly, which means that purely the behaviour of the developer is a right predictor.

Thus, answering the main research question, two of the three behavioural components of the theory of planned behaviour are good predictors for developers’ willingness to pay. This implies that if developers experience a more positive attitude and more social pressure by relevant parties concerning climate adaptation, they are more likely to contribute to climate adaptation and their actual willingness to pay will also increase. Developers’ willingness to pay can almost completely predicted through the components of behavioural intention, with perceived behavioural control being the exception to this rule. Theory of planned behaviour seems thus a fitting theory for testing willingness to pay of developers for climate adaptation.

## 5.2 Possible further development of theory based on the results of the study

Looking at its theoretical implications, this study goes against the conclusion of other similar studies. Van der Krabben et al. (2023) assert that developers are willing to consider contributing to climate adaptation but that financial obstacles prevent developers from actually doing so. This does not align with what this study has found about developers actually experiencing control for most components of PBC. Developers do indicate that more transparency and equality would lead to more contributions made. However, this study shows that their actual behaviour is primarily influenced by attitude and norms of the developers, and not by the control they experience. It is the question, whether in the future, when the contributing process has possibly been made easier for developers, developers’ willingness to pay for climate adaptation will rise. Additionally, it is possible that although some developers will have control over their contributions, they still do not want to contribute. This emphasizes the importance of the developers’ attitude and influence by valued actors. The difference between study methods could also explain slight differences in outcomes. Since this study was anonymous and quantitative, and other studies (Hendricks et al., 2021; Van der Krabben et al., 2023) have chosen a more qualitative approach to data collection, the animosity of this study could lead to less flattering images portrayed by the respondents in comparison to non-anonymous studies (Paulhus, 1984). This is a key argument for more completely anonymous studies done on the subject.

Another important theme in the theory of this study was the call for more research on LVC and climate adaptation (Dunning & Lord, 2020; Van der Krabben et al., 2023). This study can strengthen and elaborate this research agenda by providing evidence on developers’ WTP for climate adaptation in developer agreements, which can be seen as a part of LVC implementation. The results show that developers are willing to contribute for climate adaptation via a LVC tool. This demonstrates that this research agenda is relevant and this study has provided a different approach of looking at LVC and climate adaptation, by exploring this theme combined with TPB. This gives a more behavioural

interpretation of LVC and climate adaptation, looking more into the ‘why’ and drives of developers instead of a factual overview of how LVC instruments work in different countries and its implications for value capturing for climate adaptation. Eakin et al. (2022) mentioned how dialogue about adaptation planning processes should be opened up for development interests. This study is a step in the right direction by showing what drives developers to contribute. However, the results imply that there is still a lot that needs to be uncovered regarding this subject, especially when keeping the qualitative remarks of the respondents in mind, which are not always in line with the quantitative results. This strengthens the demand for more dialogue on this topic.

Lastly, this study strengthens the growing amount of research done on the WTP of developers for environmental issues done in recent years (Oyewole et al., 2019; Van der Krabben et al., 2023). Lots of research has been done about environmental protection and its users (Grilli & Notaro, 2019; López-Mosquera et al., 2014; López-Mosquera & Sánchez, 2012; Tan et al., 2023; Tao et al., 2011; Rekola & Mika, 2001; Fielding et al., 2008). This study, however, provides a supplier’s perspective, enhancing the little research done on this subject. Moreover, this is the only study done on developers’ WTP for climate adaptation explored through TPB with SEM analysis; if more studies are conducted with the same methodical framework, this could establish an argument for why developers’ behaviour matters on the subject of WTP.

### 5.3 Recommendations for praxis

The biggest practical implication of this research could be that the municipality should potentially focus less on the contributing process, and more on convincing developers that climate adaptation is critically necessary in development projects, to shield civilians from the dangers that climate change brings, such as floodings and extreme heat. Another more practical argument that could be made to convince developers to invest in climate adaptation is that it raises the value of their land and development. If developers are convinced by this rationale, they will take the initiative themselves to implement urban climate adaptation infrastructure into their developments, instead of waiting for governmental institutions to better their policy on financial contributions within developments, especially for climate adaptation.

Besides convincing developers that contributing to climate adaptation is a good idea, actors that influence developers’ decision making process should be convinced of the urgency for climate adaptation too. If they do not care about climate adaptation, developers will not be encouraged to invest in these features. For example, if scientists had not revealed that climate change is one of the biggest threats to human existence (Calvin et al., 2023), the pressure and urgency to incorporate climate adaptation within developments would have, according to this study, been lower.

### 5.4 Reflection on the limits of the study and on further research

The first limitation of this study is that the sample size is rather small for an analysis such as SEM. For SEM, often a sample size of at least 100 and preferably over 200 is recommended (Kline, 2016; Hair et al., 2019), whereas in this study there were only 89 respondents who completely filled in the questionnaire. The model is also quite complex, which is not ideal when there already is a small sample size. Small sample sizes often come across problems with model fit estimates scoring lower than compared to larger samples (Fan et al., 2009). To fix this, the model could be minimized for only very strong predictors and loadings, but that would go against the theory underlying the model. Cutoff criteria for model fits seem to be very stringent and inaccurate at times, depending on regression weights. A model with low values for the paths may score higher in model fit estimates in contrast to a model with high values for paths and low scores for model estimates (McNeish et al., 2017). This makes it difficult to completely follow the standard guidelines for model fits estimates, and a fair amount of own interpretation of the model is needed to form a definitive conclusion.

What this study also lacks is good measurement for PBC. Intention, norms and attitude were all measured decently, but for PBC, this was not the case. There was much variation in responses to items for PBC. This could mean two things, the first one being that PBC differs too much for developers per item and is really not a good measurement, or second, the questions being asked for PBC were not measuring PBC properly. For transparency and equality, the last observation is probably true. This is because the questions should have been stated as ‘The policy of the municipality is transparent enough for me to contribute’ and ‘The policy between municipalities is equal enough for me to contribute’. This would have accurately measured the behaviour of developers. Instead, the questions asked in the questionnaire used in this research inquire information about a hypothetical situation, where the purpose is to measure the actual behaviour.

Lastly, this study could have been improved by following TPB questionnaire guidelines more strictly. With subjective norms, a third question was added, which tried to measure if developers value the opinion of the actor. This question was partly based on Ajzen’s (1985) emphasis on the researched group’s perception of both the actor’s importance and its influence on their decision making. However, this should be completely researched before the development of the questionnaire and not asked during the questionnaire. The question did not measure the norms for every actor in an acceptable way.

For future research, the first recommendation will be to repeat this study, but then with changed items for PBC and transparency and equality. Doing the same study again with a few modifications will make clear if PBC really does not have an influence on WTP, or that it does have an influence and the items have been measured wrong in this research. Transparency and equality can also be included as a moderating factor. In doing so, the researcher will be sure that the behavioural components are appropriately measured. Researching PBC is especially important since respondents mentioned in the qualitative part of the research that less control experienced was the case for why they did not contribute. This could also be lack of self awareness, but this should be tested before being confirmed as argument for why developers’ behaviour goes against their statements.

Secondly, it is advised to look further into developers’ attitudes and subjective norms. Delving deeper into what drives developers’ willingness to contribute, based on attitudes, gives insight into how developers could be motivated to contribute more in future developer agreements. It is also interesting to research the relationship between developers and the actors that influence the decision making of developers. This will move away from the idea that governmental institutions should improve their policy on climate adaptation – and developer agreements in general – but look more at the intrinsic motivation of developers. Not just developers that are motivated to contribute should be looked at, but especially developers that are not motivated should be taken into account. It is advisable to do this anonymously, since developers would perhaps be more comfortable giving non-socially accepted answers (Paulhus, 1984). This could be researched quantitatively or qualitatively. It could, however, be difficult to conduct qualitative research completely anonymously.

A last recommendation is that there should be more research into the business cases of developers. Respondents made this clear in their comments in the questionnaire:

*“The question of if a developer wants to contribute to climate adaptation is pretty easy to answer. When this generates a value increment and when the business case of the developer is enlarged, there surely is a willingness to use this increment (or a part of it) for climate adaptation measures”.*

*“As a developer you judge the total amount of payments. This should fit within the business case”.*

Clearly, there is a problem with the business case of developers, and delving further into what is causing these problems, makes room for investigating the number of contributions to climate adaptation. If money is the biggest problem for developers, withholding them from contributing, an investigation into the cause of these shortages is necessary.

## Literature

- Ajzen, I. (1985). From Intentions to Actions: A Theory of Planned Behavior. In J. Kuhl & J. Bechmann (Eds.), *Action Control* (pp. 11-39). Springer. <https://doi.org/10.1007/978-3-642-69746-3>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. doi:10.1016/0749-5978(91)90020-t
- Ajzen, I. (2006). *Constructing a Theory of Planned Behaviour Questionnaire*. [https://www.researchgate.net/publication/235913732\\_Constructing\\_a\\_Theory\\_of\\_Planned\\_Behavior\\_Questionnaire](https://www.researchgate.net/publication/235913732_Constructing_a_Theory_of_Planned_Behavior_Questionnaire)
- Ajzen, I., & Driver, B. L. (1992). Contingent value measurement: On the nature and meaning of willingness to pay. *Journal of Consumer Psychology*, 1(4), 297–316. doi:10.1016/s1057-7408(08)80057-5
- Albouy, D., Graf, W., Kellogg, R., & Wolff, H. (2016). Climate amenities, climate change, and American quality of life. *Journal of the Association of Environmental and Resource Economists*, 3(1), 205–246. <https://doi.org/10.1086/684573>
- Alhamad, H., & Donyai, P. (2021). The Validity of the Theory of Planned Behaviour for Understanding People’s Beliefs and Intentions toward Reusing Medicines. *Pharmacy*, 9(1), 58. doi:10.3390/pharmacy9010058
- Alin, A. (2010). Multicollinearity. *Wiley Interdisciplinary Reviews: Computational Statistics*, 2(3), 370–374. doi:10.1002/wics.84
- Allen, N. (2015). Understanding the Importance of Urban Amenities: A Case Study from Auckland. *Buildings*, 5(1), 85–99. doi:10.3390/buildings5010085
- Awang, Z., Afthanorhan, W. M. A. W., & Asri, M. (2015). Parametric and Non Parametric Approach in Structural Equation Modeling (SEM): The Application of Bootstrapping. *Modern Applied Science*, 9(9). <https://doi.org/10.5539/mas.v9n9p58>
- Aziz, A., Anwar, M. M., & Dawood, M. (2020). The impact of neighborhood services on land values: an estimation through the hedonic pricing model. *GeoJournal* 86, 1915–1925. doi:10.1007/s10708-019-10127-w
- Bao, H. X. H., Glascock, J. L., Zhou, S. H., & Feng, L. Z. (2014). Land value determination in an emerging market: empirical evidence from China. *International Journal of Managerial Finance*, 10(2), 180–199. doi:10.1108/ijmf-03-2012-0033
- Bernath, K., & Roschewitz, A. (2008). Recreational benefits of urban forests: Explaining visitors’ willingness to pay in the context of the theory of planned behavior. *Journal of Environmental Management*, 89(3), 155–166. doi:10.1016/j.jenvman.2007.01.059
- Bishop, R. C., & Boyle, K. J. (2018). Reliability and Validity in Nonmarket Valuation. *Environmental and Resource Economics*, 72, 559-582. doi:10.1007/s10640-017-0215-7
- Bréchet, T., Hritonenko, N., & Yatsenko, Y. (2012). Adaptation and Mitigation in Long-term Climate Policy. *Environmental and Resource Economics*, 55(2), 217–243. doi:10.1007/s10640-012-9623-x
- Brown, T. C. (2000). Introduction to Stated Preference Models. In P.A. Champ, K. J. Boyle, & T. C. Brown (Eds.), *A Primer on Nonmarket Valuation* (pp. 99-110). Springer.
- Brown, G., & Glanz, H. (2018). Identifying potential NIMBY and YIMBY effects in general land use planning and zoning. *Applied Geography*, 99, 1–11. doi:10.1016/j.apgeog.2018.07.026

- Browne, M. W., & Cudeck, R. (1992). Alternative Ways of Assessing Model Fit. *Sociological Methods & Research*, 21(2), 230–258. doi:10.1177/0049124192021002005
- Buitelaar, E., Bregman, A., Broek Van Den, L., Evers, D., Nieuwenhuizen, W., Sorel, N. (2010). *Ex-durante evaluatie Wet Ruimtelijke Ordening, eerste resultaten*. Planbureau voor de Leefomgeving. Retrieved on January 26, from <https://www.pbl.nl/sites/default/files/downloads/PBL-2010-Ex-durante-WRO.pdf>
- Buitelaar, E., Bregman, A., Broek Van Den, L., Evers, D., Galle, M., Meijer, T., & Sorel, N. (2012). *Ex-durante evaluatie Wet Ruimtelijke Ordening, eerste resultaten: tweede rapportage*. Planbureau voor de Leefomgeving. Retrieved on February 11, from <https://www.pbl.nl/sites/default/files/downloads/PBL-2012-WRO-500160001.pdf>
- Calvin, K., Dasgupta, D., Krinner, G., Mukherji, A., Thorne, P., Trisos, C. H., . . . Ha, M. A. T. T. (2023). IPCC, 2023: *Climate Change 2023: Synthesis Report, Summary for Policymakers. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland. IPCC, 1–34. <https://doi.org/10.59327/ipcc/ar6-9789291691647.001>
- Carson, R. T., Flores, N. E., & Meade, N. F. (2001). *Environmental and Resource Economics*, 19(2), 173–210. doi:10.1023/a:1011128332243
- Carson, R. T., & Louviere, J. J. (2011). A Common Nomenclature for Stated Preference Elicitation Approaches. *Environmental and Resource Economics*, 49(4), 539–559. doi:10.1007/s10640-010-9450-x
- Carson, R. T. (2012). Contingent Valuation: A Practical Alternative when Prices Aren't Available. *Journal of Economic Perspectives*, 26(4), 27–42. doi:10.1257/jep.26.4.27
- Cheshire, P., & Sheppard, S. (1995). On the Price of Land and the Value of Amenities. *Economica*, 62(246), 247. doi:10.2307/2554906
- Cole, D. A., Ciesla, J. A., & Steiger, J. H. (2007). The insidious effects of failing to include design-driven correlated residuals in latent-variable covariance structure analysis. *Psychological Methods*, 12(4), 381–398. doi:10.1037/1082-989x.12.4.381
- Crawford, I., & De Rock, B. (2014). Empirical Revealed Preference. *Annual Review of Economics*, 6(1), 503–524. doi:10.1146/annurev-economics-080213-041238
- Damurski, Ł. (2015). From Formal to Semi-formal and Informal Communication in Urban Planning. Insights from Polish Municipalities. *European Planning Studies*, 23(8), 1568–1587. doi:10.1080/09654313.2014.993935
- Dunning, R. J., & Lord, A. (2020). Viewpoint: Preparing for the climate crisis: What role should land value capture play? *Land Use Policy*, 99, 104867. doi:10.1016/j.landusepol.2020.104867
- Eakin, H., Keele, S., & Lueck, V. (2022). Uncomfortable knowledge: Mechanisms of urban development in adaptation governance. *World Development*, 159, 106056. <https://doi.org/10.1016/j.worlddev.2022.106056>
- Escobedo, F. J., Adams, D. C., & Timilsina, N. (2015). Urban forest structure effects on property value. *Ecosystem Services*, 12, 209–217. <https://doi.org/10.1016/j.ecoser.2014.05.002>
- Evans, D., & Norman, P. (1998). Understanding pedestrians' road crossing decisions: an application of the theory of planned behaviour. *Health Education Research*, 13(4), 481–489. doi:10.1093/her/13.4.481-a

- Fan, X., & Wang, L. (1998). Effects of Potential Confounding Factors on Fit Indices and Parameter Estimates for True and Misspecified SEM Models. *Educational and Psychological Measurement*, 58(5), 701–735. doi:10.1177/0013164498058005001
- Feng, X., & Humphreys, B. (2016). Assessing the Economic Impact of Sports Facilities on Residential Property Values. *Journal of Sports Economics*, 19(2), 188–210. doi:10.1177/1527002515622318
- Fielding, K. S., McDonald, R. I., & Louis, W. R. (2008). Theory of planned behaviour, identity and intentions to engage in environmental activism. *Journal Of Environmental Psychology*, 28(4), 318–326. <https://doi.org/10.1016/j.jenvp.2008.03.003>
- Fox, N.J. (2008) Post-positivism. In: Given, L.M. (ed.) *The SAGE Encyclopaedia of Qualitative Research Methods*. London: Sage
- Francis, J., Eccles, M. P., Johnston, M., Walker, A. E., Grimshaw, J. M., Foy, R., Kaner, E. F. S., Smith, L. & Bonetti, D. (2004). *Constructing questionnaires based on the theory of planned behaviour: A manual for health services researchers*. Newcastle upon Tyne, UK: Centre for Health Services Research, University of Newcastle upon Tyne.
- Gensler and Urban Land Institute (2011). *Open Space: An Asset without a Champion*. Urban Land Institute. [https://www.gensler.com/uploads/document/220/file/Open\\_Space\\_03\\_08\\_2011.pdf](https://www.gensler.com/uploads/document/220/file/Open_Space_03_08_2011.pdf)
- Glaeser, E. L., Kolko, J., & Saiz, A. (2001). Consumer city. *Journal of Economic Geography*, 1(1), 27–50. doi:10.1093/jeg/1.1.27
- Glumac, B., Herrera-Gomez, M., & Licheron, J. (2019). A hedonic urban land price index. *Land Use Policy*, 81, 802–812. doi:10.1016/j.landusepol.2018.11.032
- Grilli, G., & Notaro, S. (2019). Exploring the influence of an extended theory of planned behaviour on preferences and willingness to pay for participatory natural resources management. *Journal of environmental management*, 232, 902-909.
- Gunawardena, K., Wells, M., & Kershaw, T. (2017). Utilising green and bluespace to mitigate urban heat island intensity. *Science of The Total Environment*, 584–585, 1040–1055. <https://doi.org/10.1016/j.scitotenv.2017.01.158>
- Hair, J. F., Babin, B. J., Black, W. C., & Anderson, R. E. (2019). *Multivariate data analysis*. Cengage.
- Harris, C. C., Driver, B. ., & McLaughlin, W. J. (1989). Improving the contingent valuation method: A psychological perspective. *Journal of Environmental Economics and Management*, 17(3), 213–229. doi:10.1016/0095-0696(89)90017-x
- Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence Based Nursing*, 18(3), 66–67. doi:10.1136/eb-2015-102129
- Hendricks, A., Lacoere, P., Van der Krabben, E., & Oorschot, C. (2021). Limits of Negotiable Developer Obligations. *Sustainability*, 13(20), 11364.
- Heurkens, E., & Hobma, F. (2014). Private sector-led urban development projects: Comparative insights from planning practices in the Netherlands and the UK. *Planning Practice and Research*, 29(4), 350–369. <https://doi.org/10.1080/02697459.2014.932196>
- Hussain, T., Abbas, J., Wei, Z., Ahmad, S., Xuehao, B., & Gaoli, Z. (2021b). Impact of Urban Village Disamenity on Neighboring Residential Properties: Empirical Evidence from Nanjing through Hedonic Pricing Model Appraisal. *Journal of Urban Planning and Development*, 147(1), 0402005. [https://doi.org/10.1061/\(asce\)up.1943-5444.0000645](https://doi.org/10.1061/(asce)up.1943-5444.0000645)

- Janssen, J., Luiten, E., Renes, H., & Rouwendal, J. (2012). Heritage planning and spatial development in the Netherlands: changing policies and perspectives. *International Journal of Heritage Studies*, 20(1), 1–21. doi:10.1080/13527258.2012.710852
- Johnson, B. K., Whitehead, J. C., Mason, D. S., & Walker, G. J. (2012). Willingness to pay for downtown public goods generated by large, sports-anchored development projects: The CVM approach. *City, Culture and Society*, 3(3), 201–208. doi:10.1016/j.ccs.2012.06.007
- Jöreskog, K. G. (1993). Testing structural equation models. In K. A. Bollen & J. S. Lang (Eds.), *Testing structural equation models* (pp. 294–316). Newbury Park, CA: Sage
- Kaplan, D. (2001). Structural Equation Modeling. *International Encyclopedia of the Social & Behavioral Sciences*, 15215–15222. doi:10.1016/b0-08-043076-7/00776-2
- Katt, F., & Meixner, O. (2020). A systematic review of drivers influencing consumer willingness to pay for organic food. *Trends in Food Science & Technology*, 100, 374–388. doi:10.1016/j.tifs.2020.04.029
- Kelly, D. L., & Molina, R. (2023). Adaptation infrastructure and its effects on property values in the face of climate risk. *Journal of the Association of Environmental and Resource Economists*, 10(6), 1405–1438. <https://doi.org/10.1086/725109>
- Kiel, K. A. (2021). *Climate Change Adaptation and Property Values: A Survey of the Literature. Working paper*. Cambridge, MA: Lincoln Institute of Land Policy (August).
- Kline, R. B. (1998). *Principles and practice of structural equation modeling*. Guilford Publications.
- Kline, R. B. (2016). *Principles and practice of structural equation modeling*. Guilford Publications.
- Kong, F., Yin, H., & Nakagoshi, N. (2007). Using GIS and landscape metrics in the hedonic Price modeling of the amenity value of urban green space: a case study in Jinan City, China. *Landscape and Urban Planning*, 79(3–4), 240–252. <https://doi.org/10.1016/j.landurbplan.2006.02.013>
- Köszegi, B., & Rabin, M. (2007). Mistakes in Choice-Based Welfare Analysis. *American Economic Review*, 97(2), 477–481. doi:10.1257/aer.97.2.477
- Van der Krabben, E., Lord, A., Spencer, J. H., & Buckman, S. (2023). *Willingness to Pay for Climate Adaptation: International Case Studies on Private Developers' Preparedness to Contribute to Urban Climate Adaptation. Working paper*. Cambridge, MA: Lincoln Institute of Land Policy (August).
- Kuddus, A., Tynan, E., & McBryde, E. S. (2020). Urbanization: a problem for the rich and the poor? *Public health reviews*, 41(1). <https://doi.org/10.1186/s40985-019-0116-0>
- Kumar, S. (2015). Structure Equation Modeling Basic Assumptions and Concepts: A Novices Guide. *Asian Journal of Management Sciences*, 3(7), 25–28
- Łaszek, J., & Olszewski, K. (2015). The behaviour of housing developers and aggregate housing supply. *Social Science Research Network*. <https://doi.org/10.2139/ssrn.2642756>
- Latham, A., & Layton, J. (2019). Social infrastructure and the public life of cities: Studying urban sociality and public spaces. *Geography Compass* 13(7), e12444. doi:10.1111/gec3.12444
- De Leve, E., Geuting, E., & Temming, R. (2022). *Kostenverhaal in anterieure overeenkomst woningbouw 2020*. Stec Groep.
- Levin, K. A. (2006). Study design III: Cross-sectional studies. *Evidence-Based Dentistry*, 7(1), 24–25. doi:10.1038/sj.ebd.6400375

- Li, Z., Hensher, D. A., & Rose, J. M. (2010). Willingness to pay for travel time reliability in passenger transport: A review and some new empirical evidence. *Transportation Research Part E: Logistics and Transportation Review*, 46(3), 384–403. doi:10.1016/j.tre.2009.12.005
- Li, H., Wei, Y. D., Wu, Y., & Tian, G. (2018). Analyzing housing prices in Shanghai with open data: amenity, accessibility and urban structure. *Cities*, 91, 165–179. <https://doi.org/10.1016/j.cities.2018.11.016>
- López-Mosquera, N., García, T., & Barrena, R. (2014). An extension of the Theory of Planned Behavior to predict willingness to pay for the conservation of an urban park. *Journal of Environmental Management*, 135, 91–99. doi:10.1016/j.jenvman.2014.01.019
- López-Mosquera, N., & Sánchez, M. (2012). Theory of Planned Behavior and the Value-Belief-Norm Theory explaining willingness to pay for a suburban park. *Journal of Environmental Management*, 113, 251–262. doi:10.1016/j.jenvman.2012.08.029
- Lu, W., Peng, Y., Webster, C., & Zuo, J. (2015). Stakeholders' willingness to pay for enhanced construction waste management: A Hong Kong study. *Renewable and Sustainable Energy Reviews*, 47, 233–240. doi:10.1016/j.rser.2015.03.008
- Mahmoudi, P., Hatton MacDonald, D., Crossman, N. D., Summers, D. M., & van der Hoek, J. (2012). Space matters: the importance of amenity in planning metropolitan growth. *Australian Journal of Agricultural and Resource Economics*, 57(1), 38–59. doi:10.1111/j.1467-8489.2012.00608.x
- Mandell, S., & Wilhelmsson, M. (2011). Willingness to Pay for Sustainable Housing. *Journal of Housing Research*, 20(1), 35-52. 10.2307/24861523
- Manski, C. F. (2000). Economic Analysis of Social Interactions. *Journal of Economic Perspectives*, 14(3), 115–136. doi:10.1257/jep.14.3.115
- Mathur, S., & Smith, A. (2013). Land value capture to fund public transportation infrastructure: Examination of joint development projects' revenue yield and stability. *Transport Policy*, 30, 327–335. doi:10.1016/j.tranpol.2013.09.016
- Matthews, P., Bramley, G., & Hastings, A. (2014). Homo Economicus in a Big Society: Understanding Middle-class Activism and NIMBYism towards New Housing Developments. *Housing, Theory and Society*, 32(1), 54–72. doi:10.1080/14036096.2014.947173
- McDougall, J. A., Furnback, W. E., Wang, B. C. M., & Mahlich, J. (2020). Understanding the global measurement of willingness to pay in health. *Journal of Market Access & Health Policy*, 8(1), 1717030. doi:10.1080/20016689.2020.1717030
- McNeish, D., An, J., & Hancock, G. R. (2017). The Thorny Relation Between Measurement Quality and Fit Index Cutoffs in Latent Variable Models. *Journal of Personality Assessment*, 100(1), 43–52. doi:10.1080/00223891.2017.1281286
- Miller, J., & Ulrich, R. (2019). The quest for an optimal alpha. *PLOS ONE*, 14(1), e0208631. doi:10.1371/journal.pone.0208631
- Mitchell, R. C., & Carson, R. T. (1989). *Using Surveys to Value Public Goods: The Contingent Valuation Method* (1st ed.). RFF Press
- Muñoz Gielen, D. (2012). Urban governance, property rights, land readjustment and public value capturing. *European Urban and Regional Studies*, 21(1), 60–78. doi:10.1177/0969776412440543

- Muñoz Gielen, D., & Lenferink, S. (2018). The role of negotiated developer obligations in financing large public infrastructure after the economic crisis in the Netherlands. *European Planning Studies*, 26(4), 768–791. doi:10.1080/09654313.2018.1425376
- Murakami, J. (2018). The Government Land Sales programme and developers' willingness to pay for accessibility in Singapore, 1990–2015. *Land Use Policy*, 75, 292–302. doi:10.1016/j.landusepol.2018.03.050
- Murphy, J. J., Allen, P. G., & Stevens, T. H. (2005). A Meta-analysis of Hypothetical Bias in Stated Preference Valuation. *Environmental And Resource Economics*, 30(3), 313–325. <https://doi.org/10.1007/s10640-004-3332-z>
- Musil, C. M., Jones, S. L., & Warner, C. D. (1998). Structural equation modeling and its relationship to multiple regression and factor analysis. *Research in Nursing & Health*, 21(3), 271–281. doi:10.1002/(sici)1098-240x(199806)21:3<271::aid-nur10>3.0.co;2-g
- Nemet, G. F., & Johnson, E. (2010). Willingness to Pay for Climate Policy: A Review of Estimates. *SSRN Electronic Journal 2010-011*. doi:10.2139/ssrn.1626931
- Olsen, J. A., & Smith, R. D. (2001). Theory versus practice: a review of willingness-to-pay in health and health care. *Health Economics*, 10(1), 39–52. doi:10.1002/1099-1050(200101)10:1<39::aid-hec563>3.0.co;2-e
- Van Ommeren, J. N., & Van der Vlist, A. J. (2016). Households' willingness to pay for public housing. *Journal of Urban Economics*, 92, 91–105. <https://doi.org/10.1016/j.jue.2015.11.007>
- Osborne, J. W. & Waters, E. (2002). Four assumptions of multiple regression that researchers should always test. *Practical Assessment, Research, and Evaluation* 8(2) <https://doi.org/10.7275/r222-hv23>
- Oyewole, M. O., Ojutalayo, A. A., & Araloyin, F. M. (2019). Developers' willingness to invest in green features in Abuja, Nigeria. *Smart And Sustainable Built Environment*, 8(3), 206–219. <https://doi.org/10.1108/sasbe-06-2018-0031>
- Paniagua-Molina, J., Solórzano-Thompson, J., González-Blanco, C., & Barboza-Navarro, D. (2021). Hedonic Price for Amenities in Rural and Urban Residential Condominiums in Costa Rica. *Real Estate Management and Valuation*, 29(3), 52–64. <https://doi.org/10.2478/remav-2021-0021>
- Paulhus, D. L. (1984). Two-component models of socially desirable responding. *Journal of Personality and Social Psychology*, 46(3), 598–609. doi:10.1037/0022-3514.46.3.598
- Peterson, G. E. (2008). *Unlocking Land Values to Finance Urban Infrastructure*. World Bank Publications. <https://doi.org/10.1596/978-0-8213-7709-3>
- Plastrik, P., Coffee, J., & Cleveland, J. (2019). *Playbook 1.0: How cities are paying for climate resilience*. Innovation Network for Communities. <https://static1.squarespace.com/static/5736713fb654f9749a4f13d8/t/5d275d9135b62f0001df44b5/1562860947122/Playbook%2b1.0%2bHow%2bCities%2bAre%2bPaying%2bfor%2bClimate%2bResilience%2bJuly%2b2019.pdf>
- Read, D. C., & Sanderford, D. (2017). Innovation Districts at the Cross road of the Entrepreneurial City and the Sustainable City. *Journal Of Sustainable Real Estate*, 9(1), 131–152. <https://doi.org/10.1080/10835547.2017.12091895>
- Rekola, E. P., Mika. (2001). The Theory of Planned Behavior in Predicting Willingness to Pay for Abatement of Forest Regeneration. *Society & Natural Resources*, 14(2), 93–106. doi:10.1080/089419201300000517

- Robin, E., & Brill, F. (2018). The global politics of an urban age: creating “cities for all” in the age of financialisation. *Palgrave Communications*, 4(1). doi:10.1057/s41599-017-0056-6
- Rohde, C., & Lützkendorf, T. (2009). Step-by-Step to Sustainable Property Investment Products. *Journal of Sustainable Real Estate*, 1(1), 227–240. doi:10.1080/10835547.2009.12091791
- Del Saz-Salazar, S., & García-Menéndez, L. (2005). Public provision versus private provision of industrial land: a hedonic approach. *Land Use Policy*, 22(3), 215–223. doi:10.1016/j.landusepol.2004.05.002
- Saunders, M., Lewis, P., & Thornhill, A. (2023). *Research Methods for Business Students* (9th edn). Pearson Publishing.
- Scally, C. P. (2012). The Nuances of NIMBY. *Urban Affairs Review*, 49(5), 718–747. doi:10.1177/1078087412469341
- Schmidt, J., & Bijmolt, T. H. A. (2019). Accurately measuring willingness to pay for consumer goods: a meta-analysis of the hypothetical bias. *Journal of the Academy of Marketing Science*, 48, 499–518. doi:10.1007/s11747-019-00666-6
- Shih, M., & Shieh, L. (2020). Negotiating Density and Financing Public Goods in Vancouver and New Taipei City: A Development Rights Perspective. *Planning Practice & Research*, 35(4), 380–395. doi:10.1080/02697459.2020.1767393
- Silva, M. M., & Costa, J. P. (2018). Urban Floods and Climate Change Adaptation: The Potential of Public Space Design When Accommodating Natural Processes. *Water*, 10(2), 180. doi:10.3390/w10020180
- Smith, V. K. (1993). Nonmarket Valuation of Environmental Resources: An Interpretive Appraisal. *Land Economics*, 69(1), 1. doi:10.2307/3146275
- Sniehotta, F. (2009). An Experimental Test of the Theory of Planned Behavior. *Applied Psychology: Health and Well-Being*, 1(2), 257–270. doi:10.1111/j.1758-0854.2009.01013.x
- Sorel, N., Tennekes, J., & Galle, M. (2014). *Bekostiging van publieke voorzieningen bij organische gebiedsontwikkeling* (No. 1057). Planbureau voor de Leefomgeving. Retrieved on February 11, from [https://www.pbl.nl/sites/default/files/downloads/PBL\\_2014\\_Samenvatting\\_Bekostiging-van-publieke-voorzieningen-bij-organische-gebiedsontwikkeling\\_1057.pdf](https://www.pbl.nl/sites/default/files/downloads/PBL_2014_Samenvatting_Bekostiging-van-publieke-voorzieningen-bij-organische-gebiedsontwikkeling_1057.pdf)
- Stead, D. (2013). Urban planning, water management and climate change strategies: adaptation, mitigation and resilience narratives in the Netherlands. *International Journal of Sustainable Development & World Ecology*, 21(1), 15–27. doi:10.1080/13504509.2013.824928
- Streiner, D. L. (2006). Building a Better Model: An introduction to structural equation modelling. *The Canadian Journal of Psychiatry*, 51(5), 317–324. <https://doi.org/10.1177/070674370605100507>
- Sussman, R., & Gifford, R. (2018). Causality in the Theory of Planned Behavior. *Personality And Social Psychology Bulletin*, 45(6), 920–933. <https://doi.org/10.1177/0146167218801363>
- Sweldens, S., Corneille, O., & Yzerbyt, V. (2014). The Role of Awareness in Attitude Formation Through Evaluative Conditioning. *Personality and Social Psychology Review*, 18(2), 187–209. doi:10.1177/1088868314527832
- Taber, K. S. (2017). The use of Cronbach’s Alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48(6), 1273–1296. <https://doi.org/10.1007/s11165-016-9602-2>

- Taherdoost, H. (2019). What Is the Best Response Scale for Survey and Questionnaire Design; Review of Different Lengths of Rating Scale / Attitude Scale / Likert Scale. *International Journal of Academic Research in Management*, 8(1), 1-10.
- Tan, T. L. (2011). Measuring the Willingness to Pay for Houses in a Sustainable Neighborhood. *The International Journal of Environmental, Cultural, Economic, and Social Sustainability: Annual Review*, 7(1), 1–12. <https://doi.org/10.18848/1832-2077/cgp/v07i01/54854>
- Tan, Y., Ying, X., Gao, W., Wang, S., & Liu, Z. (2023). Applying an extended theory of planned behavior to predict willingness to pay for green and low-carbon energy transition. *Journal of Cleaner Production*, 387, 135893. <https://doi.org/10.1016/j.jclepro.2023.135893>
- Tao, Y., Duan, M., & Deng, Z. (2021). Using an extended theory of planned behaviour to explain willingness towards voluntary carbon offsetting among Chinese consumers. *Ecological Economics*, 185, 107068. <https://doi.org/10.1016/j.ecolecon.2021.107068>
- Tarakci, S., & Turk, S. S. (2021). Public value capturing in urban renewal: the fikirtepe case (Istanbul, Turkey). *Journal of Housing and the Built Environment*, 37, 125-155. doi:10.1007/s10901-021-09849-6
- Van Thiel, S. (2014). *Research Methods in Public Administration and Public Management An introduction*. Routledge.
- United Nations. (2019). World Urbanization Prospects: the 2018 revision. <https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf>
- Venkatachalam, L. (2004). The contingent valuation method: a review. *Environmental Impact Assessment Review*, 24(1), 89–124. doi:10.1016/s0195-9255(03)00138-0
- Visser, P., van Dam, F., & Hooimeijer, P. (2008). Residential Environment and Spatial Variation in House Prices in the Netherlands. *Tijdschrift Voor Economische En Sociale Geografie*, 99(3), 348–360. doi:10.1111/j.1467-9663.2008.00472.x
- Walters, L. C. (2013). Land value capture in policy and practice. *Journal of Property Tax Assessment & Administration*, 10(2), 5-21. Retrieved from <https://researchexchange.iaao.org/jptaa/vol10/iss2/1>
- Wertenbroch, K., & Skiera, B. (2002). Measuring consumers' willingness to pay at the point of purchase. *Journal of Marketing Research*, 39(2), 228–241.
- Wong, S. K., Li, L. & Monkkonen, P. (2019) How do developers price new housing in a highly oligopolistic city? *International Real Estate Review*, 22(3), 307-332.
- Zhang, L., Sun, C., Liu, H., & Zheng, S. (2016). The role of public information in increasing homebuyers' willingness-to-pay for green housing: Evidence from Beijing. *Ecological Economics*, 129, 40–49. doi:10.1016/j.ecolecon.2016.05.010
- Zhong, F., Li, L., Guo, A., Song, X., Cheng, Q., Zhang, Y., & Ding, X. (2019). Quantifying the Influence Path of Water Conservation Awareness on Water-Saving Irrigation Behavior Based on the Theory of Planned Behavior and Structural Equation Modeling: A Case Study from Northwest China. *Sustainability*, 11(18), 4967. doi:10.3390/su11184967
- Zuur, A. F., Ieno, E. N., & Elphick, C. S. (2009). *A protocol for data exploration to avoid common statistical problems*. *Methods in Ecology and Evolution*, 1(1), 3–14. doi:10.1111/j.2041-210x.2009.00001.x

# Annex

## Appendix A: Operationalisation table ‘Willingness to pay’

Concept	Variables	Indicators	Question	Measurement	Literature
Willingness to pay	Contingent Valuation choice scenario for investing in climate adaptation measures	Drainage; road/bridge elevation or improvements; pumping stations; shoreline stabilization; small water-holding infrastructure	The higher amount of public amenities such as climate change adaptations, the more liveable a city is (Allen, 2015; Latham & Layton, 2019). For this scenario, you are going to develop a project with 500 houses nearby the city centre, with a medium-high building density. The city has about 150.000 inhabitants and struggles regularly with climate induced problems such as the heat island effect and flooding. The municipality expects you to contribute to neighbourhood facilities. There is no macro-capping. How much would you be willing to pay for climate change adaptations in the developer agreement? Make a generalized guess on your knowledge, experience and personal opinion.	1. Nothing 2. € 1 - € 250 3. € 251 - € 500. 4. € 501 - € 750. 5. € 751 - € 1000. 6. More than € 1000	(Ajzen & Driver, 1992; Evans & Norman, 1998; De Leve et al., 2020; Kelly & Molina, 2023; Gunawardena et al., 2017)
	Intention to perform certain behaviour	Having intention performing the behaviour of paying for climate change adaptations	I plan to make contributions for climate change adaptations in future developer agreements  I will try to make contributions for climate change adaptations in future developer agreements	1. Not at all - 7. Frequently  1. Not at all - 7. Very much	(Ajzen & Driver, 1992)
	Attitude toward the behaviour	The overall positive or negative experience with the outcomes of paying for public amenities	I think that paying for public amenities is	1. Not valuable - 7. Valuable  1. Bad - 7. Good  1. Useless - 7. Useful	(Rekola & Mika, 2001; Fielding et al., 2008; Ajzen, 2006)

			1. Not important - 7. Important
	The beliefs that underlie the attitude of the developers towards paying for public amenities	I think that climate change adaptations are being reflected in property prices	1. Completely disagree - 7. Completely agree (Zhong et al., 2019)
Subjective norms	The social pressure being felt by the developer to contribute to climate change adaptations. Actors that put pressure include: government, citizens, scientists, developers	The [actor] thinks that I should contribute to climate change adaptations	1. Completely disagree - 7. Completely agree (Rekola & Mika, 2001; Fielding et al., 2008)
		If I engage in making contributions for climate change adaptations, the [actor] would approve	1. Completely disagree - 7. Completely agree
		I value the opinion of the [actor]	1. Completely disagree - 7. Completely agree (Ajzen, 1985)
Perceived behavioural control	Developers' evaluation of the action of paying for climate change adaptations	For me, contributing to climate change adaptations would be an easy process	1. Completely disagree - 7. Completely agree (Fielding et al., 2008)
		Any contributions I would make, would improve the amount of climate change adaptations	1. Completely disagree - 7. Completely agree
		Any contributions I would make, would improve the quality of climate change adaptations	1. Completely disagree - 7. Completely agree
		I, as a developer, have enough money to contribute to climate change adaptations	1. Completely disagree - 7. Completely agree (López-Mosquera & Sanchez, 2012)
		I, as a developer, have enough time to contribute to climate change adaptations	1. Completely disagree - 7. Completely agree
		I, as a developer, have enough opportunities to contribute to public amenities	1. Completely disagree - 7. Completely agree

	<p>Transparency and equality of the municipality experienced by the developer during the process of developing a contract for developer obligations</p>	<p>The more transparent a municipality is, the more I am willing to contribute</p>	<p>1. Completely disagree - 7. Completely agree</p>	<p>(Hendricks et al., 2021)</p>
		<p>The more equality in policy between municipalities, the more I am willing to contribute</p>	<p>1. Completely disagree - 7. Completely agree</p>	

## Appendix B: Normality test

### Statistics

		Intention_1	Intention_2	Attitude_Experience_1	Attitude_Experience_2	Attitude_Experience_3
N	Valid	89	89	89	89	89
	Missing	0	0	0	0	0
Skewness		-1,008	-,814	-1,526	-1,260	-1,021
Std. Error of Skewness		,255	,255	,255	,255	,255
Kurtosis		,606	,128	3,734	2,129	1,089
Std. Error of Kurtosis		,506	,506	,506	,506	,506

### Statistics

		Attitude_Experience_4	Attitude_Beliefs_1	Norms_Government_1	Norms_Government_2
N	Valid	89	89	89	89
	Missing	0	0	0	0
Skewness		-1,117	-,368	-,535	-,768
Std. Error of Skewness		,255	,255	,255	,255
Kurtosis		1,549	-,758	,236	,122
Std. Error of Kurtosis		,506	,506	,506	,506

### Statistics

		Norms_Government_3	Norms_Citizens_1	Norms_Citizens_2	Norms_Citizens_3
N	Valid	89	89	89	89
	Missing	0	0	0	0
Skewness		-,346	-,096	-,454	-,877
Std. Error of Skewness		,255	,255	,255	,255
Kurtosis		,003	-,246	,330	1,297
Std. Error of Kurtosis		,506	,506	,506	,506

### Statistics

		Norms_Scientists_1	Norms_Scientists_2	Norms_Scientists_3	Norms_Developers_1
N	Valid	89	89	89	89
	Missing	0	0	0	0
Skewness		-,114	-,513	-,446	,338
Std. Error of Skewness		,255	,255	,255	,255
Kurtosis		-1,053	,148	-,266	-,016
Std. Error of Kurtosis		,506	,506	,506	,506

### Statistics

		Norms_Developers_2	Norms_Developers_3	PBC_Evaluation_1	PBC_Evaluation_2
N	Valid	89	89	89	89
	Missing	0	0	0	0
Skewness		,255	-,352	-,134	-,155

Std. Error of Skewness	,255	,255	,255	,255
Kurtosis	,761	-,164	-,638	-,684
Std. Error of Kurtosis	,506	,506	,506	,506

### Statistics

		PBC_Evaluation_3	PBC_Evaluation_4	PBC_Evaluation_5	PBC_Evaluation_6
N	Valid	89	89	89	89
	Missing	0	0	0	0
Skewness		-,014	,003	-,128	-,383
Std. Error of Skewness		,255	,255	,255	,255
Kurtosis		-,729	-,617	-,211	-,284
Std. Error of Kurtosis		,506	,506	,506	,506

### Statistics

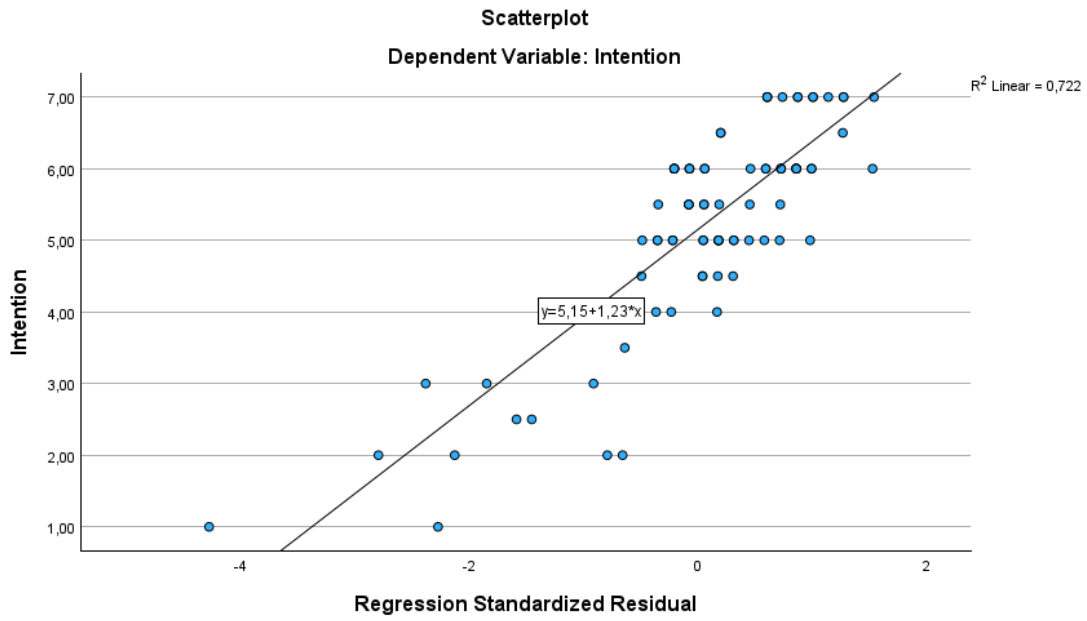
		PBC_Process_1	PBC_Process_2	Q2_Leeftijd	Q3_Provincie
N	Valid	89	89	89	89
	Missing	0	0	0	0
Skewness		-,356	-,188	-,339	,669
Std. Error of Skewness		,255	,255	,255	,255
Kurtosis		-,590	-,747	-,552	-,295
Std. Error of Kurtosis		,506	,506	,506	,506

### Statistics

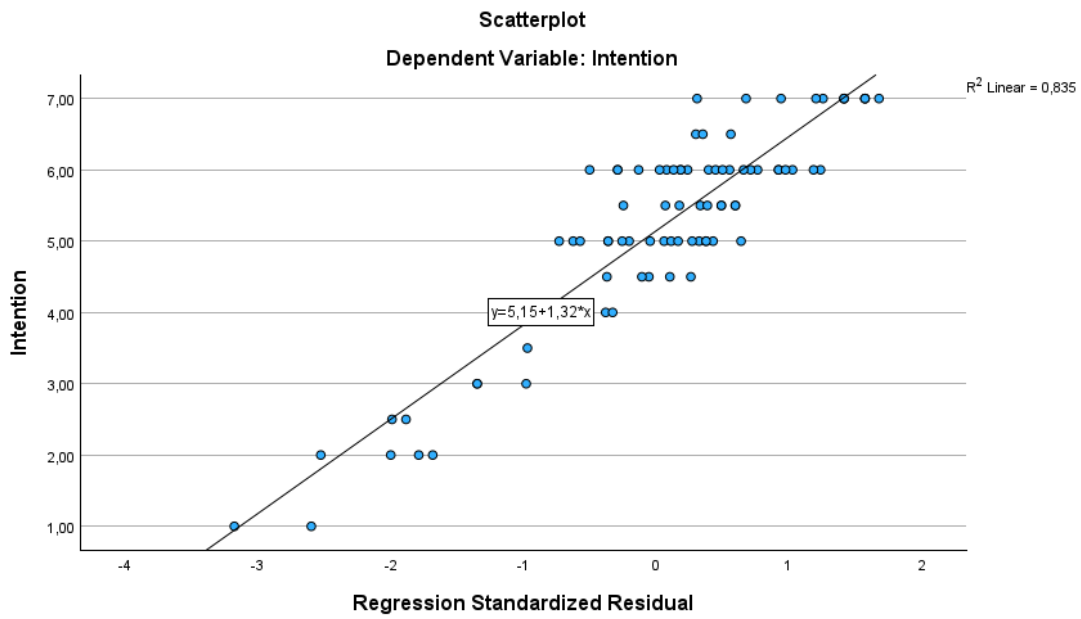
		Q4_jarenactief	Q5_geslacht	Q8_WTP
N	Valid	89	89	89
	Missing	0	0	0
Skewness		-,978	-1,801	,049
Std. Error of Skewness		,255	,255	,255
Kurtosis		,311	1,273	-1,213
Std. Error of Kurtosis		,506	,506	,506

# Appendix C: Scatterplots

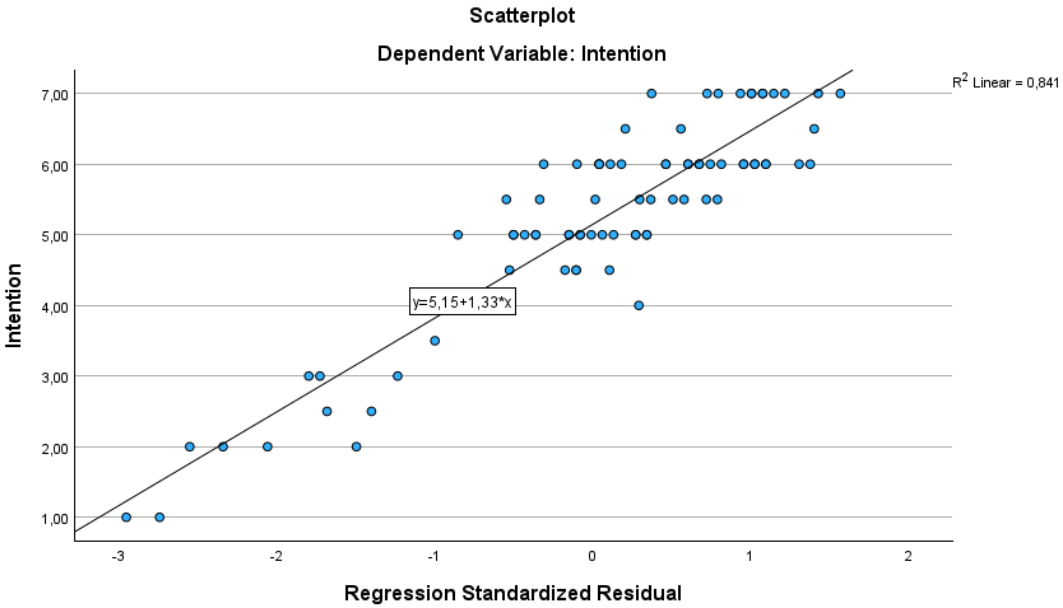
## 1. Attitude



## 2. Social norms

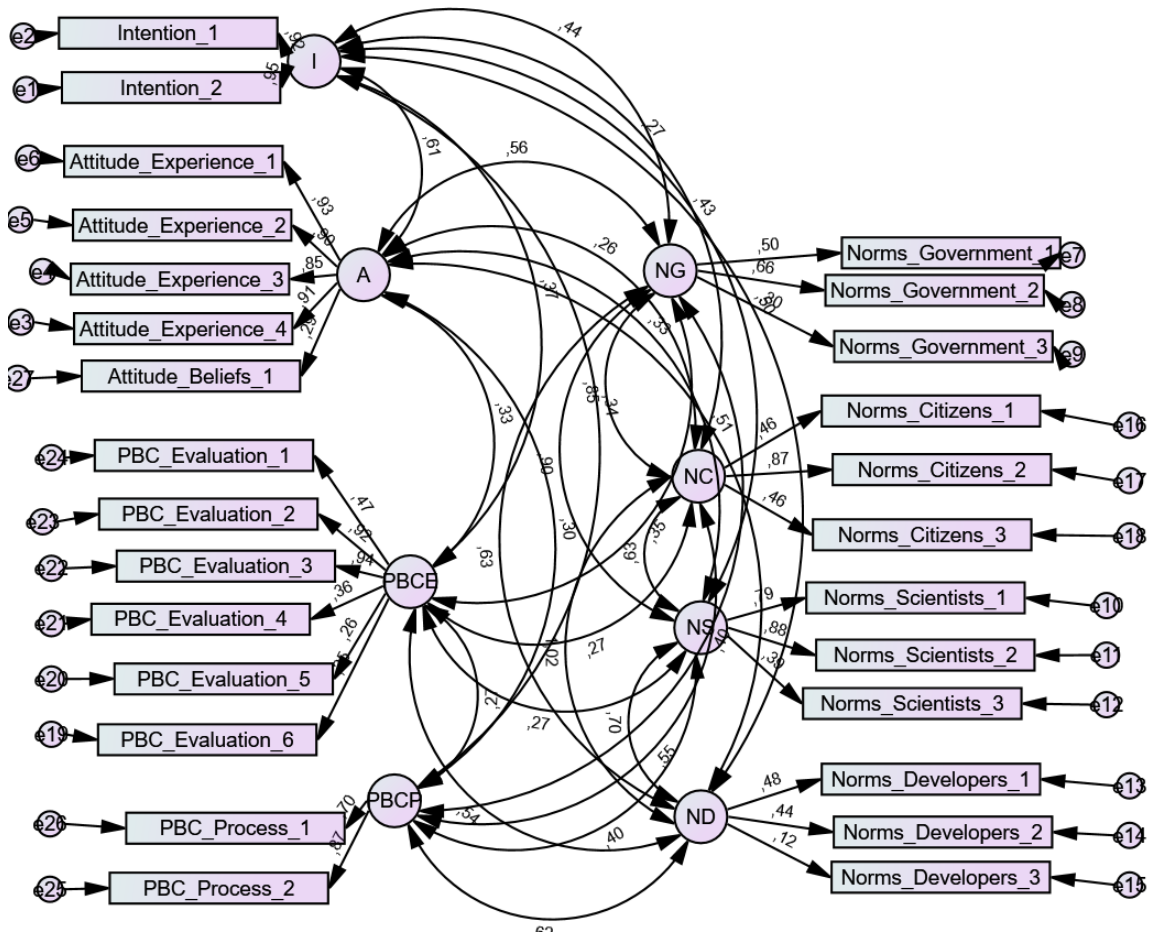


3. Perceived behavioural control



## Appendix D: CFA

### 1. Original model



### 1.1 Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	109	592,937	296	,000	2,003
Saturated model	405	,000	0		
Independence model	54	1612,021	351	,000	4,593

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	,632	,564	,774	,721	,765
Saturated model	1,000		1,000		1,000
Independence model	,000	,000	,000	,000	,000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	,843	,533	,645

Model	PRATIO	PNFI	PCFI
Saturated model	,000	,000	,000
Independence model	1,000	,000	,000

NCP

Model	NCP	LO 90	HI 90
Default model	296,937	231,399	370,254
Saturated model	,000	,000	,000
Independence model	1261,021	1140,049	1389,498

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	6,738	3,374	2,630	4,207
Saturated model	,000	,000	,000	,000
Independence model	18,318	14,330	12,955	15,790

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	,107	,094	,119	,000
Independence model	,202	,192	,212	,000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	810,937	912,671		
Saturated model	810,000	1188,000		
Independence model	1720,021	1770,421		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	9,215	8,470	10,048	10,371
Saturated model	9,205	9,205	9,205	13,500
Independence model	19,546	18,171	21,006	20,118

## 1.2 Estimates

Regression Weights: (Group number 1 - Default model)

		Estimate	S.E.	C.R.	P	Label
Intention_2	<--- I	1,000				
Intention_1	<--- I	,932	,080	11,696	***	par_1
Attitude_Experience_4	<--- A	1,000				

			Estimate	S.E.	C.R.	P	Label
Attitude_Experience_3	<---	A	,989	,084	11,829	***	par_2
Attitude_Experience_2	<---	A	1,035	,076	13,622	***	par_3
Attitude_Experience_1	<---	A	,996	,067	14,772	***	par_4
Norms_Government_1	<---	NG	1,000				
Norms_Government_2	<---	NG	1,439	,324	4,445	***	par_5
Norms_Government_3	<---	NG	,580	,229	2,530	,011	par_6
Norms_Scientists_1	<---	NS	1,000				
Norms_Scientists_2	<---	NS	1,208	,156	7,738	***	par_7
Norms_Scientists_3	<---	NS	,435	,124	3,510	***	par_8
Norms_Developers_1	<---	ND	1,000				
Norms_Developers_2	<---	ND	,836	,236	3,549	***	par_9
Norms_Developers_3	<---	ND	,248	,215	1,157	,247	par_10
Norms_Citizens_1	<---	NC	1,000				
Norms_Citizens_2	<---	NC	1,983	,488	4,068	***	par_11
Norms_Citizens_3	<---	NC	,929	,294	3,161	,002	par_12
PBC_Evaluation_6	<---	PBCE	1,000				
PBC_Evaluation_5	<---	PBCE	1,005	,599	1,677	,094	par_13
PBC_Evaluation_4	<---	PBCE	1,417	,733	1,932	,053	par_14
PBC_Evaluation_3	<---	PBCE	3,397	1,473	2,306	,021	par_15
PBC_Evaluation_2	<---	PBCE	3,469	1,504	2,306	,021	par_16
PBC_Evaluation_1	<---	PBCE	2,115	1,011	2,093	,036	par_17
PBC_Process_2	<---	PBCP	1,000				
PBC_Process_1	<---	PBCP	,758	,170	4,454	***	par_18
Attitude_Beliefs_1	<---	A	,493	,179	2,753	,006	par_19

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
Intention_2	<---	I	,950
Intention_1	<---	I	,924
Attitude_Experience_4	<---	A	,912
Attitude_Experience_3	<---	A	,852
Attitude_Experience_2	<---	A	,902
Attitude_Experience_1	<---	A	,930

	Estimate
Norms_Government_1 <--- NG	,503
Norms_Government_2 <--- NG	,664
Norms_Government_3 <--- NG	,300
Norms_Scientists_1 <--- NS	,791
Norms_Scientists_2 <--- NS	,884
Norms_Scientists_3 <--- NS	,392
Norms_Developers_1 <--- ND	,480
Norms_Developers_2 <--- ND	,445
Norms_Developers_3 <--- ND	,122
Norms_Citizens_1 <--- NC	,463
Norms_Citizens_2 <--- NC	,870
Norms_Citizens_3 <--- NC	,461
PBC_Evaluation_6 <--- PBCE	,248
PBC_Evaluation_5 <--- PBCE	,258
PBC_Evaluation_4 <--- PBCE	,358
PBC_Evaluation_3 <--- PBCE	,942
PBC_Evaluation_2 <--- PBCE	,920
PBC_Evaluation_1 <--- PBCE	,469
PBC_Process_2 <--- PBCP	,873
PBC_Process_1 <--- PBCP	,696
Attitude_Beliefs_1 <--- A	,291

### 1.3 Validity Analysis

	C R	AV E	MS V	MaxR(H )	I	A	NG	NS	ND	NC	PBC E	PBC P
<b>I</b>	0,935	0,878	0,370	0,938	<b>0,937</b>							
<b>A</b>	0,900	0,664	0,370	0,949	0,608** *	<b>0,815</b>						
<b>NG</b>	0,493	0,261	0,807	0,551	0,437*	0,562* *	<b>0,511</b>					
<b>NS</b>	0,748	0,521	0,807	0,845	0,428**	0,330*	0,898** *	<b>0,722</b>				

<b>ND</b>	0,300	0,148	1,045	0,359	0,498*	0,513*	0,624*	0,696*	0,384			
<b>NC</b>	0,639	0,394	1,045	0,785	0,269†	0,261†	0,846**	0,634*	1,022*	0,628		
<b>PBC E</b>	0,723	0,365	0,287	0,936	0,368†	0,321†	0,343	0,265	0,536†	0,263	0,604	
<b>PBC P</b>	0,765	0,623	0,390	0,805	0,342**	0,297*	0,402*	0,404*	0,624*	0,547*	0,272	0,789

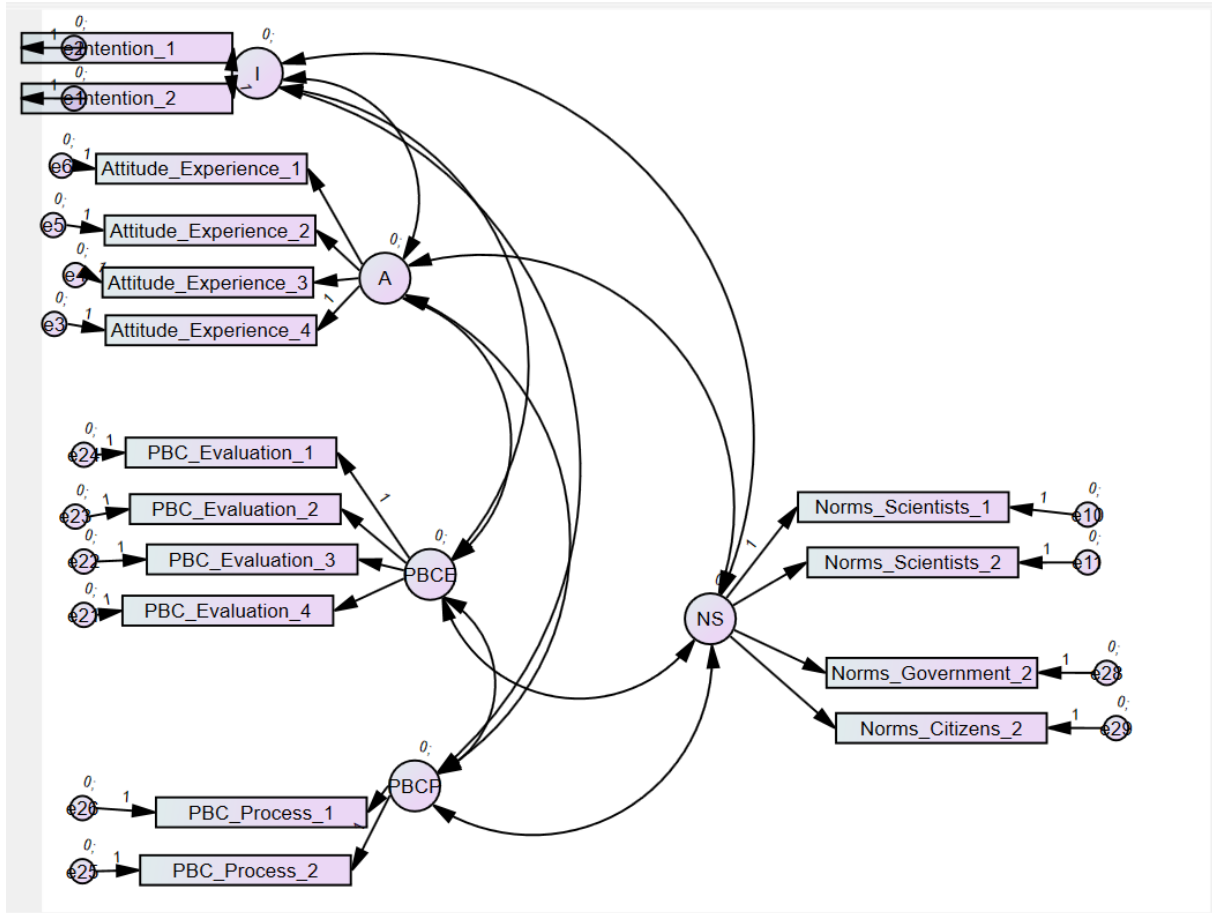
**Validity Concerns**

Reliability: the CR for NG is less than 0.70. Try removing Norms\_Government\_3 to improve CR.  
Discriminant Validity: the square root of the AVE for NG is less than its correlation with NC.  
Discriminant Validity: the square root of the AVE for NG is less than its correlation with NS.  
Convergent Validity: the AVE for NG is less than 0.50. Try removing Norms\_Government\_3 to improve AVE.  
Discriminant Validity: the AVE for NG is less than the MSV.  
Discriminant Validity: the square root of the AVE for NG is less than its correlation with A.  
Discriminant Validity: the square root of the AVE for NG is less than its correlation with ND.  
Discriminant Validity: the square root of the AVE for NS is less than its correlation with NG.  
Reliability: the CR for ND is less than 0.70. Try removing Norms\_Developers\_3 to improve CR.  
Discriminant Validity: the square root of the AVE for ND is less than its correlation with PBCP.  
Discriminant Validity: the square root of the AVE for ND is less than its correlation with NG.  
Discriminant Validity: the square root of the AVE for ND is less than its correlation with NS.  
Discriminant Validity: the square root of the AVE for ND is less than its correlation with NC.  
Convergent Validity: the AVE for ND is less than 0.50. Try removing Norms\_Developers\_3 to improve AVE.  
Discriminant Validity: the AVE for ND is less than the MSV.  
Discriminant Validity: the square root of the AVE for ND is less than its correlation with PBCE.  
Discriminant Validity: the square root of the AVE for ND is less than its correlation with A.  
Discriminant Validity: the square root of the AVE for ND is less than its correlation with I.  
Reliability: the CR for NC is less than 0.70. Try removing Norms\_Citizens\_3 to improve CR.  
Discriminant Validity: the square root of the AVE for NC is less than its correlation with NG.  
Discriminant Validity: the square root of the AVE for NC is less than its correlation with ND.  
Convergent Validity: the AVE for NC is less than 0.50. Try removing Norms\_Citizens\_3 to improve AVE.  
Discriminant Validity: the AVE for NC is less than the MSV.  
Discriminant Validity: the square root of the AVE for NC is less than its correlation with NS.  
Convergent Validity: the AVE for PBCE is less than 0.50. Try removing PBC\_Evaluation\_6 to improve AVE.

**References**

Significance of Correlations:  
† p < 0.100  
\* p < 0.050  
\*\* p < 0.010  
\*\*\* p < 0.001

## 2. Best model



### 2.1 Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	58	155,667	94	,000	1,656
Saturated model	152	,000	0		
Independence model	32	1019,121	120	,000	8,493

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	,847	,805	,933	,912	,931
Saturated model	1,000		1,000		1,000
Independence model	,000	,000	,000	,000	,000

Parsimony-Adjusted Measures

Model	PRATIO	NFI	PCFI
Default model	,783	,664	,730
Saturated model	,000	,000	,000

Model	PRATIO	PNFI	PCFI
Independence model	1,000	,000	,000

NCP

Model	NCP	LO 90	HI 90
Default model	61,667	31,262	99,968
Saturated model	,000	,000	,000
Independence model	899,121	800,926	1004,766

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1,769	,701	,355	1,136
Saturated model	,000	,000	,000	,000
Independence model	11,581	10,217	9,101	11,418

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	,086	,061	,110	,011
Independence model	,292	,275	,308	,000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	271,667	299,442		
Saturated model	304,000	376,789		
Independence model	1083,121	1098,445		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	3,087	2,742	3,522	3,403
Saturated model	3,455	3,455	3,455	4,282
Independence model	12,308	11,192	13,509	12,482

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	67	73
Independence model	13	14

## 2.2 Estimates

Regression Weights: (Group number 1 - Default model)

			<b>Estimate</b>	<b>S.E.</b>	<b>C.R.</b>	<b>P</b>	<b>Label</b>
Intention_2	<---	I	1,000				
Intention_1	<---	I	,924	,080	11,595	***	par_1
Attitude_Experience_4	<---	A	1,000				
Attitude_Experience_3	<---	A	,990	,083	11,866	***	par_2
Attitude_Experience_2	<---	A	1,033	,076	13,570	***	par_3
Attitude_Experience_1	<---	A	,995	,067	14,752	***	par_4
Norms_Scientists_1	<---	NS	1,000				
Norms_Scientists_2	<---	NS	1,414	,191	7,401	***	par_5
PBC_Evaluation_4	<---	PBCE	,652	,247	2,639	,008	par_6
PBC_Evaluation_3	<---	PBCE	1,698	,385	4,406	***	par_7
PBC_Evaluation_2	<---	PBCE	1,698	,383	4,439	***	par_8
PBC_Evaluation_1	<---	PBCE	1,000				
PBC_Process_2	<---	PBCP	1,000				
PBC_Process_1	<---	PBCP	,529	,186	2,849	,004	par_9
Norms_Government_2	<---	NS	,853	,165	5,181	***	par_20
Norms_Citizens_2	<---	NS	,878	,156	5,637	***	par_21

Standardized Regression Weights: (Group number 1 - Default model)

			<b>Estimate</b>
Intention_2	<---	I	,954
Intention_1	<---	I	,920
Attitude_Experience_4	<---	A	,913
Attitude_Experience_3	<---	A	,853
Attitude_Experience_2	<---	A	,901
Attitude_Experience_1	<---	A	,930
Norms_Scientists_1	<---	NS	,725
Norms_Scientists_2	<---	NS	,948
PBC_Evaluation_4	<---	PBCE	,334
PBC_Evaluation_3	<---	PBCE	,955
PBC_Evaluation_2	<---	PBCE	,914
PBC_Evaluation_1	<---	PBCE	,450
PBC_Process_2	<---	PBCP	1,045
PBC_Process_1	<---	PBCP	,581

	Estimate
Norms_Government_2 <--- NS	,570
Norms_Citizens_2 <--- NS	,619

### 2.3 Validity analysis

	CR	AVE	MSV	MaxR(H)	I	A	NS	PBCE	PBCP
I	0,935	0,878	0,369	0,940	0,937				
A	0,944	0,809	0,369	0,948	0,608***	0,900			
NS	0,814	0,533	0,152	0,918	0,390**	0,305*	0,730		
PBCE	0,784	0,515	0,135	0,941	0,368*	0,314*	0,229†	0,718	
PBCP	0,823	0,715	0,136	1,096	0,305**	0,249*	0,368**	0,244*	0,845

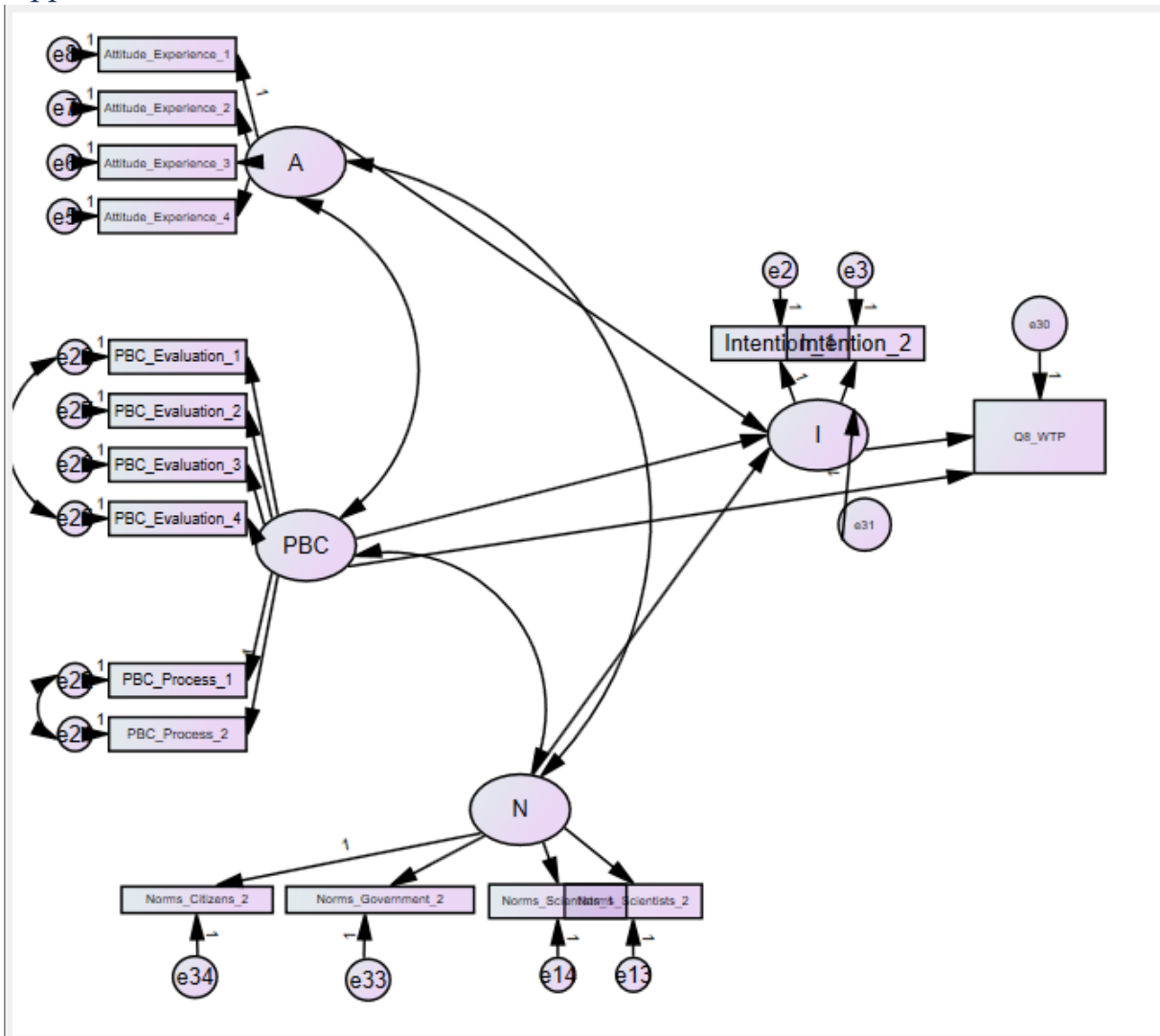
#### Validity Concerns

No validity concerns here.

#### References

Significance of Correlations:  
† p < 0.100  
\* p < 0.050  
\*\* p < 0.010  
\*\*\* p < 0.001

## Appendix E: SEM



### 1. Control variables estimates

Regression weights

		Estimate	S.E.	C.R.	P	Label
Q8_WTP	<--- Q4_jarenactief	,359	,236	1,519	,129	
Q8_WTP	<--- Q5_geslacht	,345	,384	,898	,369	
Q8_WTP	<--- Q2_Leeftijd	-,275	,280	-,983	,326	
I	<--- PBC_Process_1	-,050	,132	-,374	,708	
I	<--- PBC_Process_2	,153	,129	1,191	,234	

Standardized Regression Weights: (Group number 1 - Default model)

	Estimate
Q8_WTP <--- Q4_jarenactief	,263
Q8_WTP <--- Q5_geslacht	,076
Q8_WTP <--- Q2_Leeftijd	-,166

			Estimate
I	<---	PBC_Process_1	-,040
I	<---	PBC_Process_2	,131

## 2. Estimates before modification

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
I	<---	PBC	,751	,484	1,551	,121	
I	<---	A	,712	,142	5,018	***	
I	<---	N	,337	,163	2,063	,039	
Intention_1	<---	I	1,000				
Intention_2	<---	I	1,070	,080	13,313	***	
Attitude_Experience_4	<---	A	1,006	,068	14,773	***	
Attitude_Experience_3	<---	A	,995	,081	12,298	***	
Attitude_Experience_2	<---	A	1,038	,073	14,189	***	
Attitude_Experience_1	<---	A	1,000				
Norms_Scientists_2	<---	N	1,625	,270	6,018	***	
Norms_Scientists_1	<---	N	1,147	,205	5,595	***	
PBC_Process_2	<---	PBC	1,000				
PBC_Process_1	<---	PBC	,639	,433	1,474	,140	
PBC_Evaluation_4	<---	PBC	1,321	,648	2,038	,042	
PBC_Evaluation_3	<---	PBC	3,624	1,369	2,647	,008	
PBC_Evaluation_2	<---	PBC	3,493	1,316	2,655	,008	
PBC_Evaluation_1	<---	PBC	2,055	,891	2,306	,021	
Q8_WTP	<---	I	,759	,126	6,018	***	
Q8_WTP	<---	PBC	,280	,526	,533	,594	
Norms_Government_2	<---	N	,985	,211	4,664	***	
Norms_Citizens_2	<---	N	1,000				

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
I	<---	PBC	,176
I	<---	A	,501
I	<---	N	,204
Intention_1	<---	I	,924

			Estimate
Intention_2	<---	I	,947
Attitude_Experience_4	<---	A	,913
Attitude_Experience_3	<---	A	,853
Attitude_Experience_2	<---	A	,900
Attitude_Experience_1	<---	A	,930
Norms_Scientists_2	<---	N	,950
Norms_Scientists_1	<---	N	,725
PBC_Process_2	<---	PBC	,281
PBC_Process_1	<---	PBC	,189
PBC_Evaluation_4	<---	PBC	,323
PBC_Evaluation_3	<---	PBC	,972
PBC_Evaluation_2	<---	PBC	,897
PBC_Evaluation_1	<---	PBC	,441
Q8_WTP	<---	I	,597
Q8_WTP	<---	PBC	,052
Norms_Government_2	<---	N	,573
Norms_Citizens_2	<---	N	,614

### 1. Modification indices

Covariances: (Group number 1 - Default model)

		M.I.	Par Change
e33 <--> e34		7,931	,369
e28 <--> N		5,366	,260
e25 <--> N		7,290	,280
e25 <--> e28		19,382	,752
e22 <--> e34		11,047	,392
e22 <--> e27		5,125	-,150
e21 <--> N		7,538	,251
e21 <--> e27		5,367	-,158
e21 <--> e22		30,607	,660
e13 <--> e25		7,998	,305
e6 <--> e28		4,265	-,178

	<b>M.I.</b>	<b>Par Change</b>
e5 <--> e33	4,720	,131
e5 <--> e6	6,074	,077

## 2. Estimates after modification

Regression Weights: (Group number 1 - Default model)

			<b>Estimate</b>	<b>S.E.</b>	<b>C.R.</b>	<b>P</b>	<b>Label</b>
I	<---	PBC	,778	,476	1,634	,102	
I	<---	A	,711	,141	5,043	***	
I	<---	N	,341	,163	2,096	,036	
Intention_1	<---	I	1,000				
Intention_2	<---	I	1,070	,080	13,330	***	
Attitude_Experience_4	<---	A	1,006	,068	14,774	***	
Attitude_Experience_3	<---	A	,995	,081	12,301	***	
Attitude_Experience_2	<---	A	1,038	,073	14,188	***	
Attitude_Experience_1	<---	A	1,000				
Norms_Scientists_2	<---	N	1,630	,271	6,009	***	
Norms_Scientists_1	<---	N	1,148	,205	5,591	***	
PBC_Process_2	<---	PBC	1,000				
PBC_Process_1	<---	PBC	,637	,288	2,215	,027	
PBC_Evaluation_4	<---	PBC	1,225	,610	2,008	,045	
PBC_Evaluation_3	<---	PBC	3,663	1,365	2,683	,007	
PBC_Evaluation_2	<---	PBC	3,411	1,258	2,711	,007	
PBC_Evaluation_1	<---	PBC	1,944	,840	2,315	,021	
Q8_WTP	<---	I	,758	,126	6,030	***	
Q8_WTP	<---	PBC	,301	,515	,586	,558	
Norms_Government_2	<---	N	,984	,211	4,657	***	
Norms_Citizens_2	<---	N	1,000				

Standardized Regression Weights: (Group number 1 - Default model)

			<b>Estimate</b>
I	<---	PBC	,184
I	<---	A	,501
I	<---	N	,206
Intention_1	<---	I	,924

			Estimate
Intention_2	<---	I	,947
Attitude_Experience_4	<---	A	,913
Attitude_Experience_3	<---	A	,853
Attitude_Experience_2	<---	A	,900
Attitude_Experience_1	<---	A	,930
Norms_Scientists_2	<---	N	,951
Norms_Scientists_1	<---	N	,724
PBC_Process_2	<---	PBC	,283
PBC_Process_1	<---	PBC	,190
PBC_Evaluation_4	<---	PBC	,302
PBC_Evaluation_3	<---	PBC	,991
PBC_Evaluation_2	<---	PBC	,883
PBC_Evaluation_1	<---	PBC	,420
Q8_WTP	<---	I	,596
Q8_WTP	<---	PBC	,056
Norms_Government_2	<---	N	,572
Norms_Citizens_2	<---	N	,613

### 3. Model fit summary

CMIN

Model	NP	PAR	CMIN	DF	P	CMIN/DF
<b>Default model</b>	43	175,705	110	,000	1,597	
<b>Saturated model</b>	153	,000	0			
<b>Independence model</b>	17	1087,889	136	,000	7,999	

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
<b>Default model</b>	,166	,829	,762	,596
<b>Saturated model</b>	,000	1,000		
<b>Independence model</b>	,547	,326	,242	,290

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	,838	,800	,933	,915	,931
Saturated model	1,000		1,000		1,000
Independence model	,000	,000	,000	,000	,000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	,809	,678	,753
Saturated model	,000	,000	,000
Independence model	1,000	,000	,000

NCP

Model	NCP	LO 90	HI 90
Default model	65,705	33,468	105,865
Saturated model	,000	,000	,000
Independence model	951,889	850,519	1060,714

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1,997	,747	,380	1,203
Saturated model	,000	,000	,000	,000
Independence model	12,362	10,817	9,665	12,054

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	,082	,059	,105	,015
Independence model	,282	,267	,298	,000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	261,705	283,820	368,717	411,717
Saturated model	306,000	384,686	686,761	839,761
Independence model	1121,889	1130,632	1164,196	1181,196

ECVI

<b>Model</b>	<b>ECVI</b>	<b>LO 90</b>	<b>HI 90</b>	<b>MECVI</b>
<b>Default model</b>	2,974	2,608	3,430	3,225
<b>Saturated model</b>	3,477	3,477	3,477	4,371
<b>Independence model</b>	12,749	11,597	13,985	12,848

HOELTER

<b>Model</b>	<b>HOELTER .05</b>	<b>HOELTER .01</b>
<b>Default model</b>	68	74
<b>Independence model</b>	14	15

## Appendix F: Recoding of questions

My plan is to contribute to climate adaptation in the next 5 years in a developer agreement – Intention\_1

I will try to contribute to climate adaptation in the next 5 years in a developer agreement - Intention\_2

I think that contributing to climate adaptation is valuable – Attitude\_Experience\_1

I think that contributing to climate adaptation is good – Attitude\_Experience\_2

I think that contributing to climate adaptation is useful – Attitude\_Experience\_3

I think that contributing to climate adaptation is important – Attitude\_Experience\_4

I think that climate adaptation can be seen in the property values – Attitude\_Beliefs\_1

The government thinks that I should contribute to climate adaptation – Norms\_Government\_1

If I contribute to climate adaptation, the government will approve - Norms\_Government\_2

I value the opinion of the government - Norms\_Government\_3

Citizens think that I should contribute to climate adaptation – Norms\_Citizens\_1

If I contribute to climate adaptation, citizens will approve - Norms\_Citizens\_2

I value the opinion of citizens – Norms\_Citizens\_3

Scientists think that I should contribute to climate adaptation – Norms\_Scientists\_1

If I contribute to climate adaptation, scientists will approve - Norms\_Scientists\_2

I value the opinion of scientists - Norms\_Scientists\_3

Developers think that I should contribute to climate adaptation – Norms\_Developers\_1

If I contribute to climate adaptation, developers will approve - Norms\_Developers\_2

I value the opinion of developers - Norms\_Developers\_3

Contributing to climate adaptation is an easy process for me – PBC\_Evaluation\_1

Every contribution I make, will contribute to the amount of climate adaptation - PBC\_Evaluation\_2

Every contribution I make, will contribute to the quality of climate adaptation - PBC\_Evaluation\_3

I, as a developer, have enough money to contribute to climate adaptation - PBC\_Evaluation\_4

I, as a developer, have enough time to contribute to climate adaptation - PBC\_Evaluation\_5

I, as a developer, have enough opportunities to contribute to climate adaptation - PBC\_Evaluation\_6

The more transparent a municipality is, the more I am willing to contribute – PBC\_Process\_1

The more equality in policy between municipalities, the more I am willing to contribute - PBC\_Process\_2

Have you took part or advised for a developer agreement in the past 5 years? – Q1\_AO

What is your age? – Q2\_Leeftijd

In what province is your company? – Q3\_Provincie

How many years have you been active within your profession? – Q4\_jarenactief

What is your gender? – Q5\_geslacht

How much do you want to contribute to climate adaptation? (scenario) – Q8\_WTP

## Appendix G: Questionnaire (in Dutch)

De volgende vragen gaan over uw gedrag ten opzichte van het bijdragen aan klimaat adaptatie in een anterieure overeenkomst. Ten eerste wordt een scenario geschetst om te zien hoeveel u bereid bent om te betalen voor klimaatadaptatie. Voor de vragen die daarop volgen, kunt u dit scenario gebruiken als u een voorbeeld nodig heeft om de vragen in te kunnen vullen. De vragen gaan over uw gegeneraliseerde ervaring, probeer dit te gebruiken tijdens het invullen van de vragenlijst.

1. Heeft u gewerkt aan een anterieure overeenkomst in de afgelopen 5 jaar?
  - a. Ja
  - b. Nee > indien niet, stopt de enquête.
2. Wat is uw leeftijd?
  - a. 18 – 25
  - b. 26 – 35
  - c. 36 – 45
  - d. 46 – 55
  - e. 56 – 65
  - f. 65+
3. In welke provincie is het bedrijf waar u werkt gevestigd?
  - a. Noord-Holland
  - b. Zuid-Holland
  - c. Zeeland
  - d. Utrecht
  - e. Noord-Brabant
  - f. Limburg
  - g. Gelderland
  - h. Overijssel
  - i. Drenthe
  - j. Groningen
  - k. Friesland
  - l. Flevoland
4. Hoeveel jaar bent u actief in uw vakgebied?
  - a. 0 – 2
  - b. 3 – 5
  - c. 6 – 10
  - d. 11 – 15
  - e. 15 – 25
  - f. 25+
5. Wat is uw geslacht?
  - a. Vrouw
  - b. Man
  - c. Zeg ik liever niet
  - d. Non-binair

6. Des te groter de aanwezigheid van publieke voorzieningen zoals adaptatie voor klimaatverandering, des te leefbaarder de stad is (Allen, 2015; Latham & Layton, 2019). In dit scenario ontwikkelt u een

project van 500 woningen, dichtbij het stadcentrum, met een middelmatige-hoge dichtheid. De stad heeft ongeveer 150.000 inwoners en heeft regelmatig klimaat gerelateerde problemen, zoals het urban heat island effect en slecht afvoer van water. De gemeente verwacht van u om een financiële bijdrage te doen aan bovenwijkse voorzieningen. Er is geen sprake van macro-aftopping. Hoeveel bent u bereid om bij te dragen aan klimaat adaptatie maatregelen per woning in de anterieure overeenkomst? De maatregelen bestaan voornamelijk uit drainage, groenvoorzieningen, verhoging en/of verbetering van wegen en bruggen, gemalen, kustlijn stabilisatie en waterbergingen. Maak een gegeneraliseerde gok gebaseerd op uw kennis, ervaring en persoonlijke mening.

- a. Geen extra bijdrage
- b. € 1 - € 250
- c. € 251 - € 500.
- d. € 501 - € 750.
- e. € 751 - € 1000.
- f. Meer dan € 1000

7. Ik ben van plan om in toekomstige anterieure overeenkomsten een bijdrage te doen voor klimaatadaptatie

- 1. Helemaal niet – 7. Vaak

8. Ik zal proberen om in toekomstige anterieure overeenkomsten een bijdrage te doen voor klimaatadaptatie

- 1. Helemaal niet – 7. Heel veel

9. Ik denk dat bijdragen een klimaat adaptatie is...

- A. 1. Niet waardevol – 7. Waardevol
- B. 1. Slecht – 7. Goed
- C. 1. Nutteloos – 7. Nuttig
- D. 1. Niet belangrijk – 7. Belangrijk

10. Ik denk dat klimaat adaptatie maatregelen terug te zien zijn in de waarde van vastgoed

- 1. Volledig mee oneens – 7. Volledig mee eens

11. De overheid vindt dat ik bij moet dragen aan klimaat adaptatie

- 1. Volledig mee oneens - 7. Volledig mee eens

12. Als ik ga bijdragen aan klimaat adaptatie, keurt de overheid dat goed

- 1. Volledig mee oneens - 7. Volledig mee eens

13. Ik vind de mening van de overheid belangrijk

- 1. Volledig mee oneens - 7. Volledig mee eens

14. Burgers vinden dat ik bij moet dragen aan klimaat adaptatie

- 1. Volledig mee oneens - 7. Volledig mee eens

15. Als ik ga bijdragen aan klimaat adaptatie, keuren burgers dat goed

- 1. Volledig mee oneens - 7. Volledig mee eens

16. Ik vind de mening van burgers belangrijk
  1. Volledig mee oneens - 7. Volledig mee eens
17. Wetenschappers vinden dat ik bij moet dragen aan klimaat adaptatie
  1. Volledig mee oneens - 7. Volledig mee eens
18. Als ik ga bijdragen aan klimaat adaptatie, keuren wetenschappers dat goed
  1. Volledig mee oneens - 7. Volledig mee eens
19. Ik vind de mening van wetenschappers belangrijk
  1. Volledig mee oneens - 7. Volledig mee eens
20. Andere ontwikkelaars vinden dat ik bij moet dragen aan klimaat adaptatie
  1. Volledig mee oneens - 7. Volledig mee eens
21. Als ik ga bijdragen aan klimaat adaptatie, keuren andere ontwikkelaars dat goed
  1. Volledig mee oneens - 7. Volledig mee eens
22. Ik vind de mening van andere ontwikkelaars belangrijk
  1. Volledig mee oneens - 7. Volledig mee eens
23. Voor mij is bijdragen aan klimaat adaptatie een makkelijk proces
  1. Volledig mee oneens - 7. Volledig mee eens
24. Elke bijdrage die ik doe, zal de hoeveelheid van klimaat adaptatie maatregelen verbeteren
  1. Volledig mee oneens - 7. Volledig mee eens
25. Elke bijdrage die ik doe, zal de kwaliteit van klimaat adaptatie verbeteren
  1. Volledig mee oneens - 7. Volledig mee eens
26. Ik, als een ontwikkelaar, heb genoeg geld om bij te dragen aan klimaat adaptatie
  1. Volledig mee oneens - 7. Volledig mee eens
27. Ik, als een ontwikkelaar, heb genoeg tijd om bij te dragen aan klimaat adaptatie
  1. Volledig mee oneens - 7. Volledig mee eens
28. Ik, als een ontwikkelaar, heb genoeg mogelijkheden om bij te dragen aan klimaat adaptatie
  1. Volledig mee oneens - 7. Volledig mee eens
29. Hoe transparanter de gemeente is, des te meer ik zal willen bijdragen aan klimaat adaptatie
  1. Volledig mee oneens - 7. Volledig mee eens
30. Des te meer het beleid tussen gemeentes hetzelfde is, des te meer ik zal willen bijdragen aan klimaat adaptatie
  1. Volledig mee oneens - 7. Volledig mee eens
31. Heeft u nog vragen en/of opmerkingen?

---